ORIGINAL INSTRUCTIONS

21F
121F
221F
321F
Tier 4A (Interim)
Compact Wheel Loader

OPERATOR'S MANUAL

Part number 47954650
1st edition English
March 2017

CASE CONSTRUCTION

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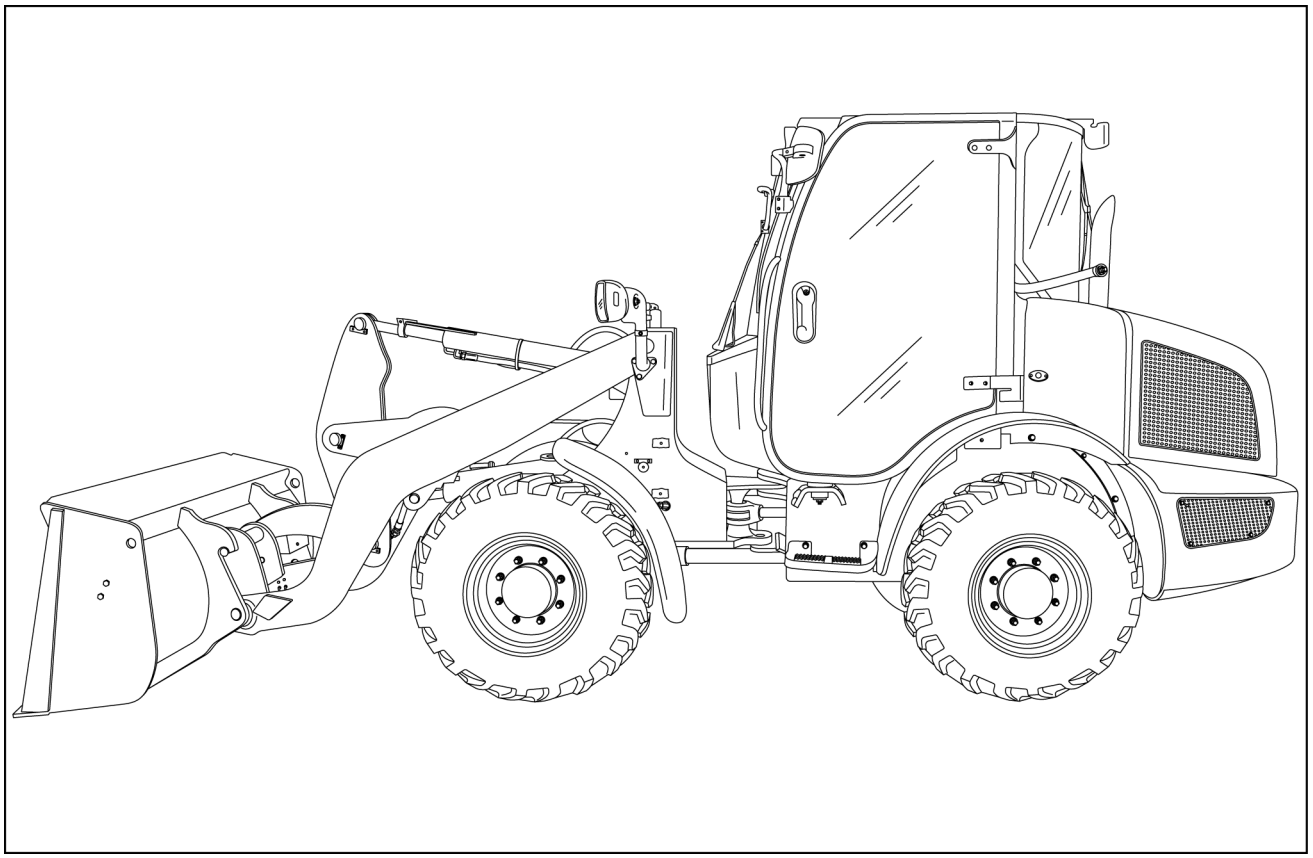
1 - GENERAL INFORMATION

Note to the Owner



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Read this manual before you start the engine or operate the machine. If you need more information, see your authorized dealer.

This manual contains important information about the safe operation, adjustment, and maintenance of your machine. Refer to the index at the back of this manual for locating specific items about your machine. The Compact Wheel Loader conforms to current safety regulations.

Consult an authorized dealer on changes, additions, or modifications that can be required for this machine to comply with various country regulations and safety requirements. Unauthorized modifications will cause serious injury or death. Anyone making such unauthorized modifications is responsible for the consequences.

DO NOT OPERATE or permit anyone to operate or service this machine until you or the other persons have read and understand the safety, operation and maintenance instructions in this manual. Use only trained operators who have demonstrated the ability to operate and service this machine correctly and safely.

This Operators Manual is to be stored in the manual compartment equipped on this machine. Make sure this manual is complete and in good condition. Contact your dealer to obtain additional manuals or manuals in languages other than that of the country of use.

Parts and accessories

Your authorized dealer carries a complete line of genuine service parts. These parts are manufactured and carefully inspected to insure high quality and accurate fitting of any necessary replacement parts.

Genuine parts and accessories have been specifically designed for these machines.
“Non-genuine” parts and accessories have not been examined or approved by the manufacturer. The installation or use of such products could have negative effects upon the design characteristics of your machine, and thereby affect its safety. The manufacturer is not liable for any damage caused by the use of “non-genuine” parts and accessories.

Company policy

Company policy, which is continually striving to improve its products, reserves the right to make improvements or changes when it becomes practical and possible to do so, without incurring any obligation to make changes or additions to the equipment sold previously.

The information in this manual is provided on the basis of information that was available at the time the manual was written. Settings, procedures, part numbers, software and other items can change. These changes can affect the maintenance performed on the machine. Ensure that you have complete and current information from your dealer before you start any machine operation.

ATTENTION: *the fuel system and engine on your machine are designed and built to government emissions standards. Tampering by dealers, customers, operators, and users is strictly prohibited by law. Failure to comply could result in government fines, rework charges, invalid warranty, legal action and possible confiscation of the machine until rework to original condition is completed. Engine service and/or repairs must be done by a certified technician only!*

Safety alert symbols

This is the safety alert symbol. It is used with and without signal words to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible death or injury.

⚠ WARNING

Illustrations in this manual may show protective shielding open or removed to better illustrate a particular feature or adjustment.
Replace all shields before operating the machine.
Failure to comply could result in death or serious injury.

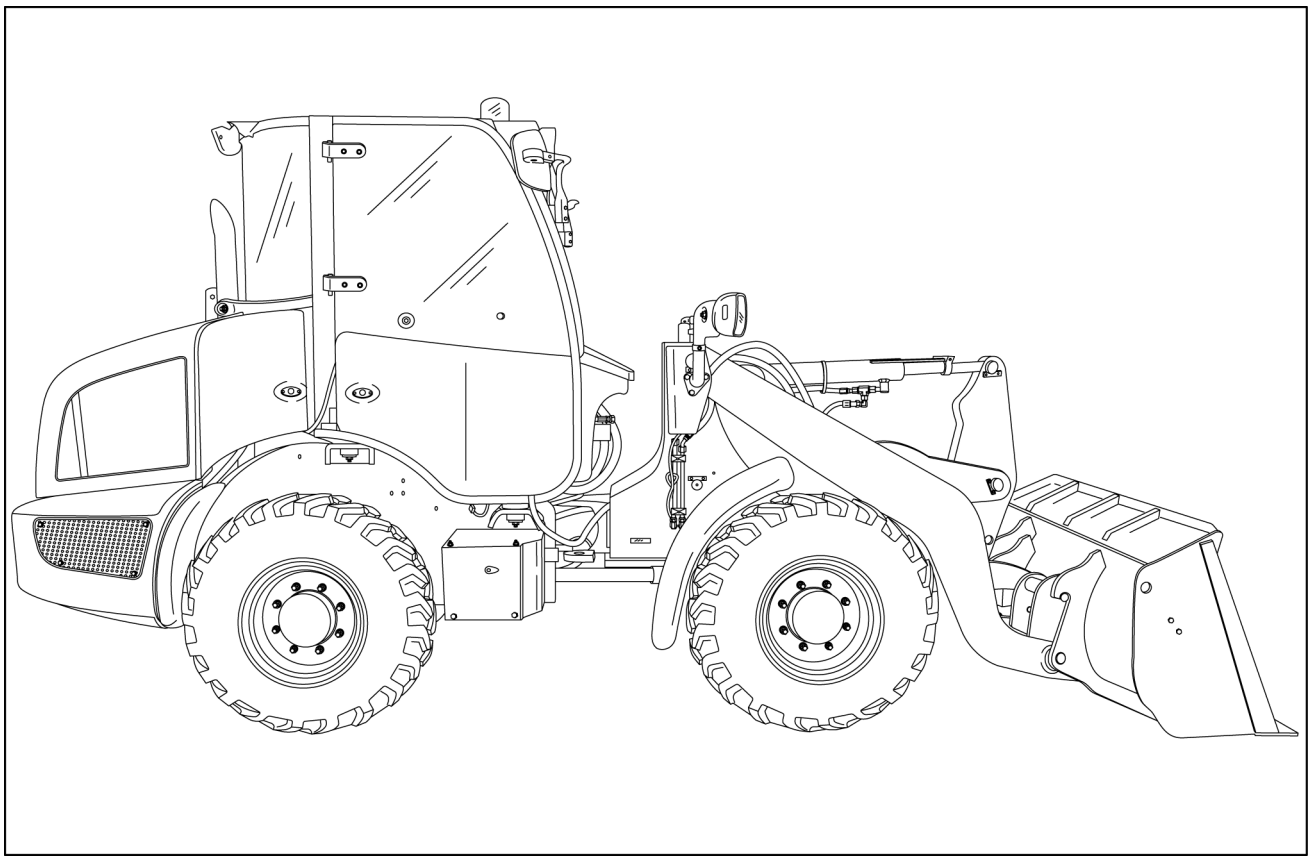
W0012A

Models main specifications

NOTE: *the following table provides general data of the main specifications for all models equipped with standard equipment (standard tires, general purpose bucket and Horizontal Pin Quick Coupler). See "Machine specifications and dimensions" – Chapter 8 in this manual for more information.*

Model	21F Z-bar	21F XT	121F Z-bar	121F XT	221F standard model	221F High Speed	321F standard model	321F High Speed
Engine net power	**43 kW (58 Hp)**	**43 kW (58 Hp)**	**48 kW (64 Hp)**	**48 kW (64 Hp)**	**55 kW (74 Hp)**	**55 kW (74 Hp)**	**55 kW (74 Hp)**	**55 kW (74 Hp)**
Operating weight	**5050 kg (11133 lb)**	**4950 kg (10913 lb)**	**5200 kg (11464 lb)**	**5000 kg (11023 lb)**	**5600 kg (12346 lb)**	**5600 kg (12346 lb)**	**6000 kg (13228 lb)**	**6000 kg (13228 lb)**
Wheelbase	**2075 mm (82 in)**	**2075 mm (82 in)**	**2075 mm (82 in)**	**2075 mm (82 in)**	**2225 mm (88 in)**	**2225 mm (88 in)**	**2225 mm (88 in)**	**2225 mm (88 in)**
Max height (cab)	**2458 mm (97 in)**	**2458 mm (97 in)**	**2457 mm (97 in)**	**2457 mm (97 in)**	**2627 mm (103 in)**	**2627 mm (103 in)**	**2680 mm (106 in)**	**2680 mm (106 in)**
Type of implement	Z-bar	Tool Carrier (TC)	Z-bar	Tool Carrier (TC)	Z-bar	Z-bar	Z-bar	Z-bar
Transmission	2 speeds	2 speeds	2 speeds	2 speeds	2 speeds	3 speeds	2 speeds	3 speeds

Intended use



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This Compact Wheel Loader, with standard equipment and attachments is intended to be used for digging and general earth moving purposes such as land leveling, truck loading, and material rehandling. Any other use is considered contrary to that established and, therefore, improper. This machine is not intended to be used for lifting other objects or transporting loads at high speeds.
This machine is not intended to be used in dangerous conditions, like on the railway etc.

DO NOT use this machine for any application or purpose other than those described in this manual, decals, or other product safety information provided with the machine. These materials define the machine's intended use.

If the loader is to be used in an application that involves special attachments or equipment, such as forestry, etc., consult an authorized dealer. Consult an authorized dealer on changes, additions or modifications that can be required for this machine to comply with various country regulations and safety requirements.

Before permitting a new operator on this machine, make certain:

- That the operator has received the necessary training to operate the machine correctly and safely.
- That the operator has read and understands the instructions given in this manual.

All persons who will be operating this machine shall possess a valid local vehicle operating permit and/or other applicable local age work permits.

NOTICE: *your Compact Wheel Loader is designed according to European directives related to health and safety risks; though it has been designed to minimize all the potential risks it is mandatory to carefully read, understand and observe all the decals and labels of the PPP (Plant Protection Product) and to always refer to information and prescriptions outlined in this manual to prevent all residual potential risks. In case you may need further assistance please do not hesitate to contact your dealer. The machine was designed and made according to the strictest quality standards and complies with 2006/42/EC.*

- Do not trespass the maximum speed limit of **10 km/h** (**6 mph**) when the machine is in load condition. Injury to operator or damage to machine may occur if operation limits are exceeded.
- Do not use the machine for another purpose than intended by the manufacturer and outlined in this manual.

- Do not use the machine on higher speeds than allowed by the load and environment. A wet surface or other low adherence conditions may increase the braking distance or result in vehicle instability. Adapt always your travelling speed according to the load of the vehicle and the characteristics of the road.
- Do not use the machine on brittle bridge heads and poor bridge floors. These constructions may collapse and cause rollover of the machine. Check out always the conditions and carrying capacity of bridges and ramps prior to engage.
- Do not use the machine without wearing the seat restraint system during activities where roll over or tip-over hazard exist. The ROPS cab or ROPS structure will only be fully effective when the driver remains attached to the seat.
- Do not use equipment mounted on the machine which is not correctly matching and firmly fixed. Such equipment may increase the risk for-over and hit the machine when coming loose.
- Do not use the machine beyond its limits of dynamic stability. High speed, abrupt manoeuvres and fast and short cornering will increase the risk of roll over.
- Do not step down from the machine without, shifting the transmission to neutral and applying the park brake. The latter equipment may have an emergency stop device on the equipment itself, as human intervention is needed during operation. But other equipment, engaged and driven by the machine will have no means to stop the power transmission, other than the clutch of the machine.
- You shall take the necessary precautions to always be aware of the possible presence of bystanders. Do not work if bystanders are within the range of the operation of the machine. Keep people away from the machine during work; bystanders must leave the working area. There is not only the risk to be overrun by the machine but objects ejected by some equipment mounted on the machine may cause harm. Stones may be thrown further than the mowed crop. Pay the necessary attention while operating next to public roads or footpaths. Thrown objects can get projected outside the field and hit unprotected people like bikers or pedestrians.
- Do not allow riders on the machine do not allow people standing on the access way or step to the cab when the machine is moving. Your view to the left-hand will be obstructed and a rider risks to fall from the machine during unforeseen or abrupt movements.
- Always stay clear from implements operating area. When operating lift controls ensure no bystanders is near to these operating areas.
- Your Compact Wheel Loader may be equipped with a number of sensors to control safety functions. Tripping these sensors will result in a safe operation mode. Do not attempt to by pass any function on the machine. You will be exposed to serious hazard, and moreover, the behavior of the machine may become unpredictable.
- A machine has only one operator station and is a one man operated vehicle. Other people on or around the machine during normal operation are not allowed.
- The machine is intended to be used under normal conditions for the applications described in this manual. If the machine is used for other purposes or in dangerous environments, for example in a flammable or explosive atmosphere, specal safety regulations must be followed and the machine must be equipped for use in these environments.

Electro-magnetic compatibility (EMC)

Interference may arise as a result of add on equipment which may not necessarily meet the required standards. As such interference can result in serious malfunction of the unit and/or create unsafe situations, you must observe the following:

- The maximum power of emission equipment (radio, telephones, etc.) must not exceed the limits imposed by the national authorities of the country where you use the machine.
- The electromagnetic field generated by the add on system should not exceed **100 V/m** at any time and at any location in the proximity of electronic components.
- The add on equipment must not interfere with the functioning of the on board electronics.

Failure to comply with these rules will render the CASE CONSTRUCTION warranty null and void.

Manual scope and required training level

Introduction to this manual

This manual gives information about the use of your CASE CONSTRUCTION machine as intended and under the conditions foreseen by CASE CONSTRUCTION during normal operation, routine service, and maintenance.

This manual does not contain all the information that relates to periodic service, conversions, and repairs that only trained service personnel can perform. Some of these activities may require appropriate facilities, technical skills, and/or tools that CASE CONSTRUCTION does not supply with the machine.

The manual contains the chapters as shown on the Contents pages. See the Index at the end of this manual to locate specific items about your CASE CONSTRUCTION machine.

Normal operation

Normal operation consists of the use of this machine for the purpose CASE CONSTRUCTION intends by an operator that:

- Is familiar with the machine and any mounted equipment or towed equipment
- Complies with the information on operation and safe practices as specified by CASE CONSTRUCTION in this manual and by the signs on the machine

Normal operation includes:

- Preparation and storage of the machine
- Addition and removal of ballast
- Connection and disconnection of mounted equipment and/or towed equipment
- Adjustment and configuration of the machine and equipment for the specific conditions of the job site, field, and/or crop
- Movement of components into and out of working positions

Routine service and maintenance

Routine service and maintenance consists of the daily activities necessary to maintain the proper machine function. The operator must:

- Be familiar with the machine characteristics
- Comply with the information on routine service and safe practices as specified by CASE CONSTRUCTION in this manual and by the signs on the machine

Routine service can include:

- Fueling
- Cleaning
- Washing
- Topping up fluid levels
- Greasing
- Replacing consumable items such as light bulbs

Periodic service, conversions, and repairs

Periodic service consists of activities that are necessary to maintain the expected life of the CASE CONSTRUCTION machine. These activities have defined intervals.

Trained service personnel familiar with the machine characteristics must perform these activities at the defined intervals. Trained service personnel must comply with the information on periodic service and safe practices as partly specified by CASE CONSTRUCTION in this manual and/or other company literature.

Periodic service includes:

- Oil change service for the engine, hydraulic circuits, or transmission
- Periodic exchange of other substances or components as required

Conversion activities rebuild the CASE CONSTRUCTION machine in a configuration that is appropriate for a specific job site, crop, and/or soil conditions (e.g., installation of dual wheels). Conversion activities must be done:

- By trained service personnel familiar with the machine characteristics
- By trained service personnel that comply with the information on conversion as partly specified by CASE CONSTRUCTION in this manual, assembly instructions, and/or other company literature

Repair activities restore proper function to a CASE CONSTRUCTION machine after a failure or degradation of performance. Dismantling activities occur during the scrapping and/or dismantling of the machine.

Trained service personnel familiar with the machine characteristics must perform these activities. Trained service personnel must comply with the information for repair as specified by CASE CONSTRUCTION in the service manual.

Before you operate

Read this manual before you start the engine or operate this CASE CONSTRUCTION machine. Contact your CASE CONSTRUCTION dealer if:

- You do not understand any information in this manual
- You need more information
- You need assistance

All persons training to operate, or who will operate this CASE CONSTRUCTION machine should be old enough to possess a valid local vehicle operating permit (or meet other applicable local age requirements). These persons must demonstrate the ability to operate and service the CASE CONSTRUCTION machine in a correct and safe manner.

Product identification

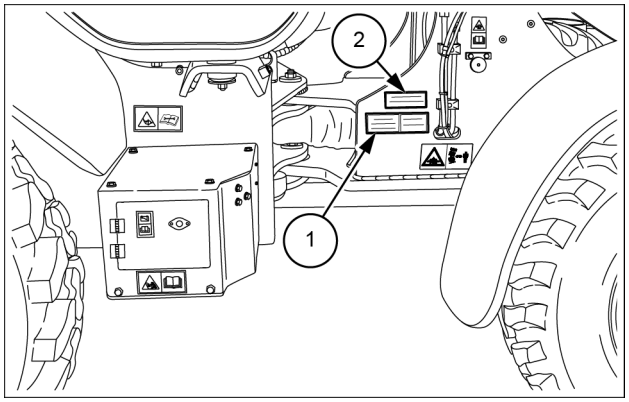
Model, serial number, and year of manufacture

Record the machine and part identification numbers. When ordering parts, obtaining information or assistance, always supply your dealer with the type and serial number of your machine or accessories. Keep a record of these numbers and your Manufacturer's Statement of Origin in a safe place. If the machine is stolen, report the numbers to your local law enforcement agency.

Machine identification

Model name
PIN
Model year

The Product identification number (PIN) plate **(1)** is located on the right-hand side of the machine.



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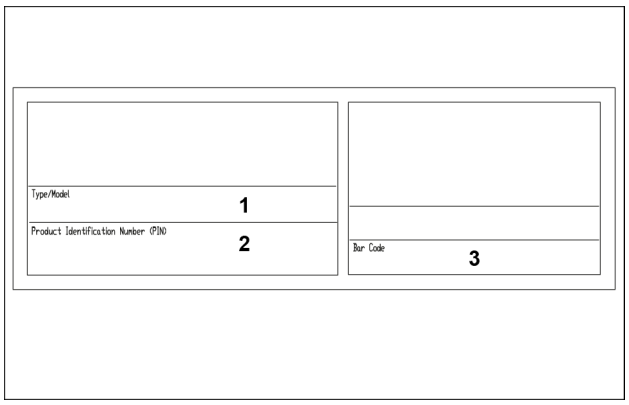
1. Indicates only the machine model.
2. Indicates the homologation code number, if foreseen.
3. Indicates the bar code of the machine.



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The decal **(2)** is located on the right-hand side of the machine.
The decal **(2)** is only for Canadian market and shows the compliance with the standard ICES-002.

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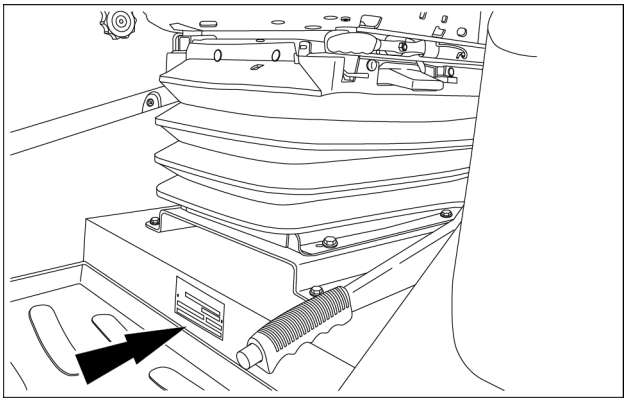
Roll-Over Protective Structure/Falling Object Protective Structure (ROPS/FOPS)

The serial number plate is under the operator's seat.



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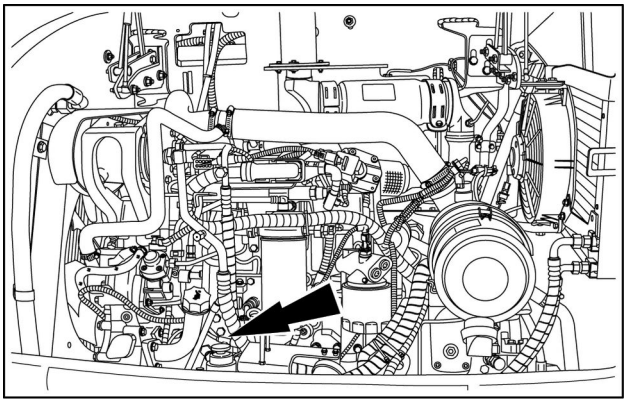
Engine make and model

Engine serial number

The serial number plate is located on the engine block, behind the fuel prefilter.
Close to the engine serial plate there is the engine approval plate that is needed for inspection purposes to proceed with the registration of the machine.



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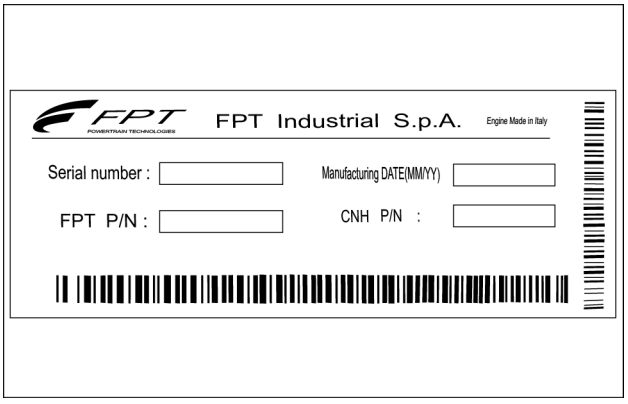
The serial number plate contains the main information of the engine.



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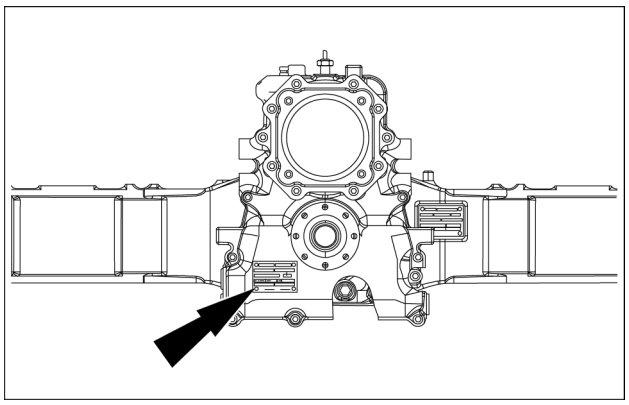
Transmission

The serial number is on the transmission face plate.



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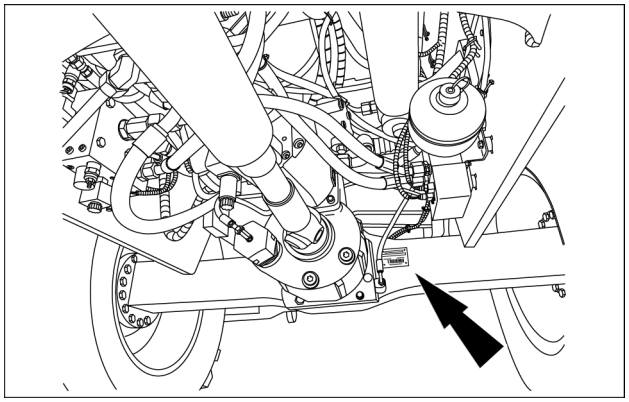
Axle

The serial number plate is on the axle cross member.



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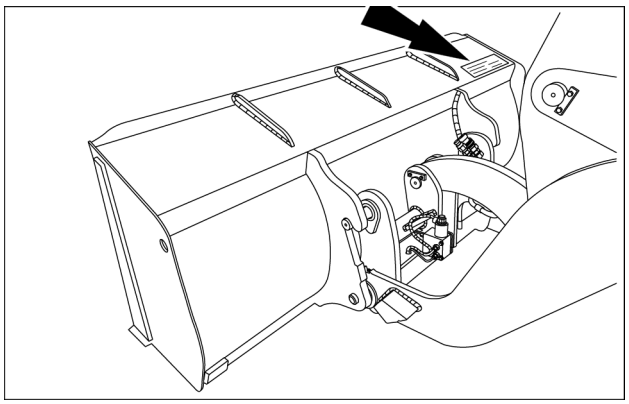
Bucket

The serial number plate is located on the right-hand side of the bucket.



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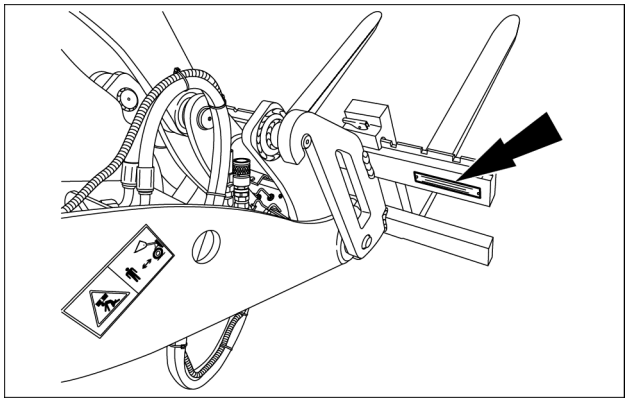
Forks

The serial number plate is located on the right-hand side of the forks.



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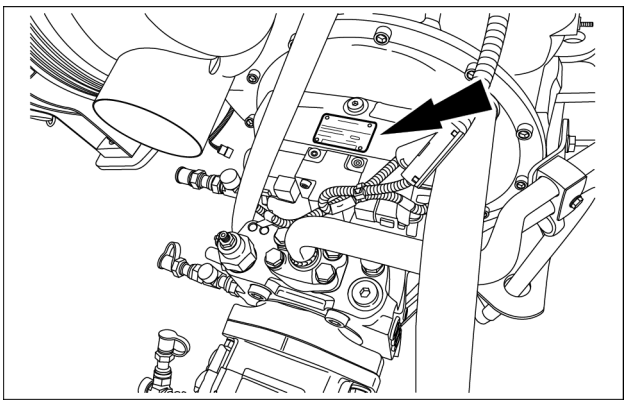
Hydrostatic pump

The serial number plate is located on the upper side of the hydrostatic pump.



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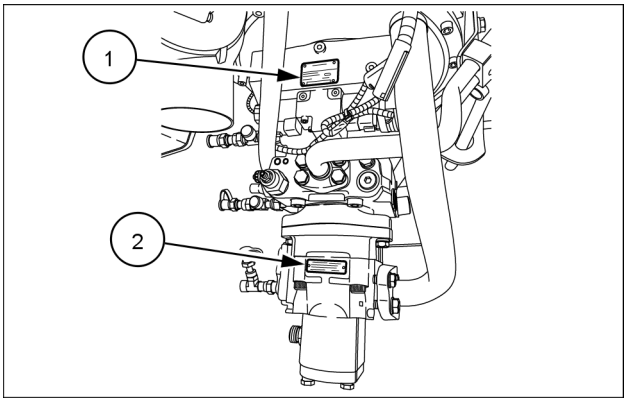
High Flow pump (optional)

If the machine is equipped with the High Flow, two serial number plates can be found:
(1) Hydrostatic pump serial number plate
(2) High Flow pump serial number plate



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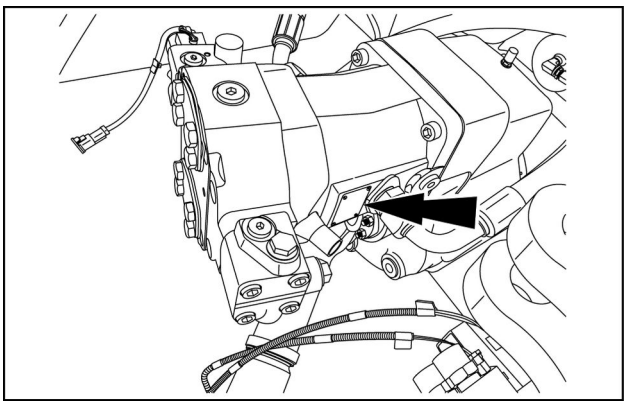
Travel motor

The serial number plate is located on the left-hand side of the travel motor.



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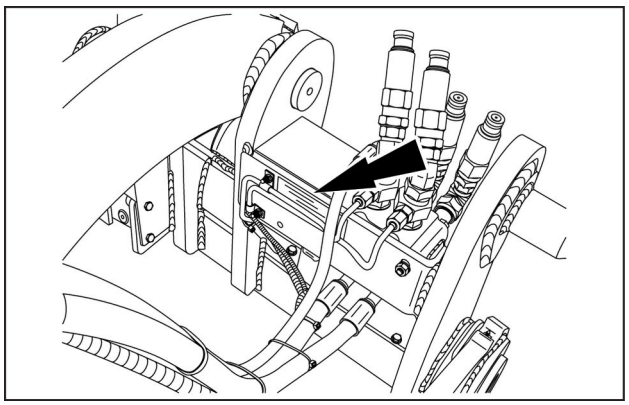
Quick Coupler

The serial number plate is located on the rear right-side of the Quick Coupler frame.



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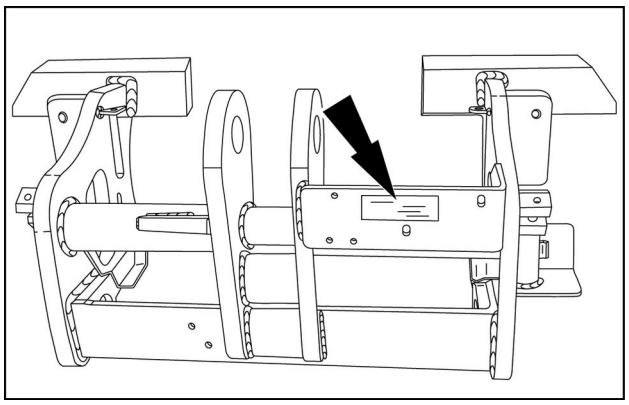
Horizontal Pin (HP) Quick Coupler



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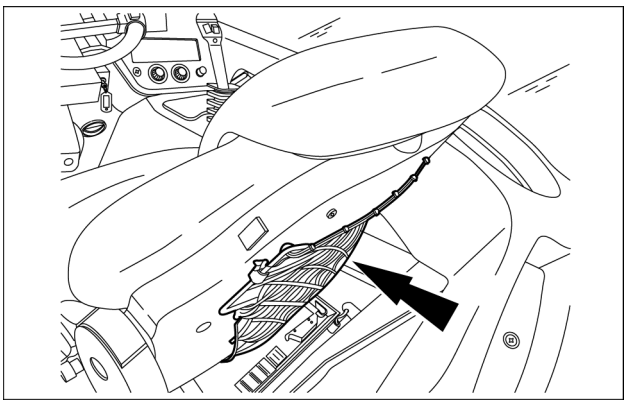
Skid Steer Loader (SSL) Quick Coupler

Operator's manual storage on the machine

The Operator’s Manual storage is located on the back of the operator’s seat.



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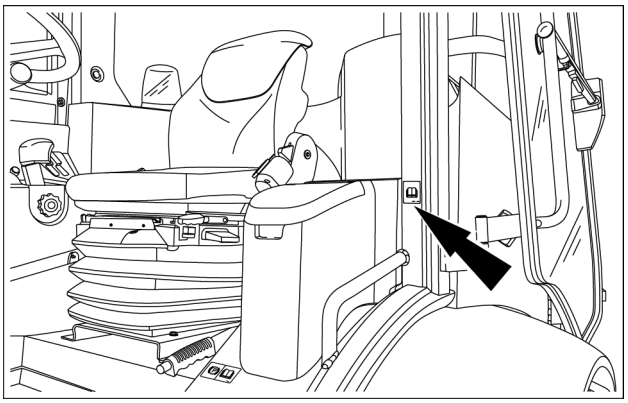
The Operator’s Manual decal is located on the pillar in the cab, to the left-hand of the operator’s seat.

READ THIS MANUAL COMPLETELY and make certain you understand the controls. All equipment has a limit. Make sure you understand the speed, brakes, steering, stability and load characteristics of this machine before you start to operate.

DO NOT remove this manual or the safety manual from the machine. See your dealer for additional manuals. Keep the Operator's Manual in the storage compartment provided on the machine. The Operator's Manual must be available for use by all operators.



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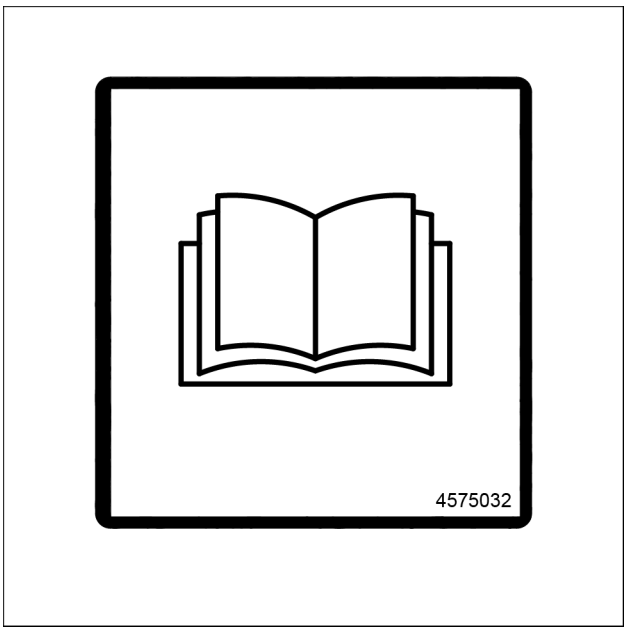
When you see this symbol read your operator's manual.

When you see this symbol refer to your service manual.



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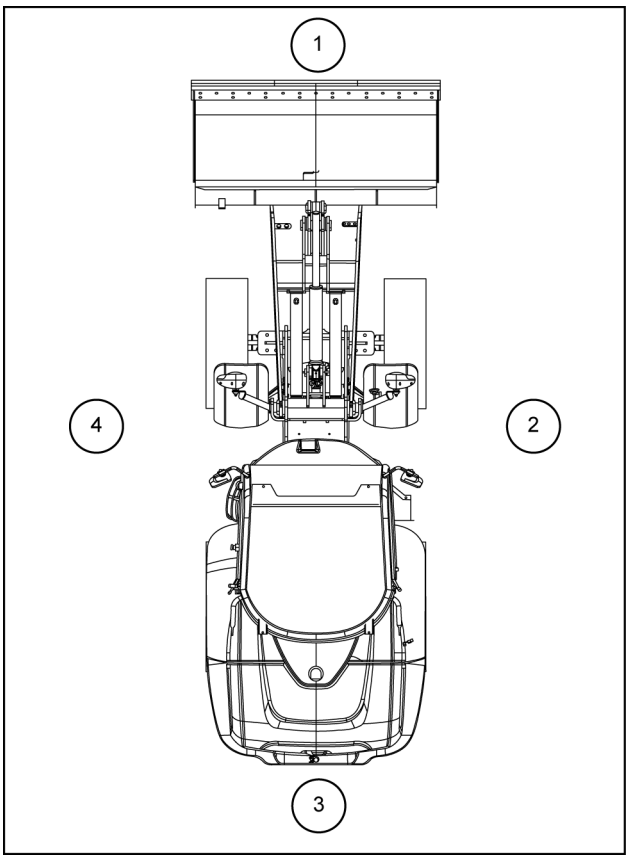
Machine orientation

The terms right-hand, left-hand, front, and rear are used in this manual to indicate the sides as they are seen from the operator's seat.

1. Front
2. Right-hand
3. Rear
4. Left-hand



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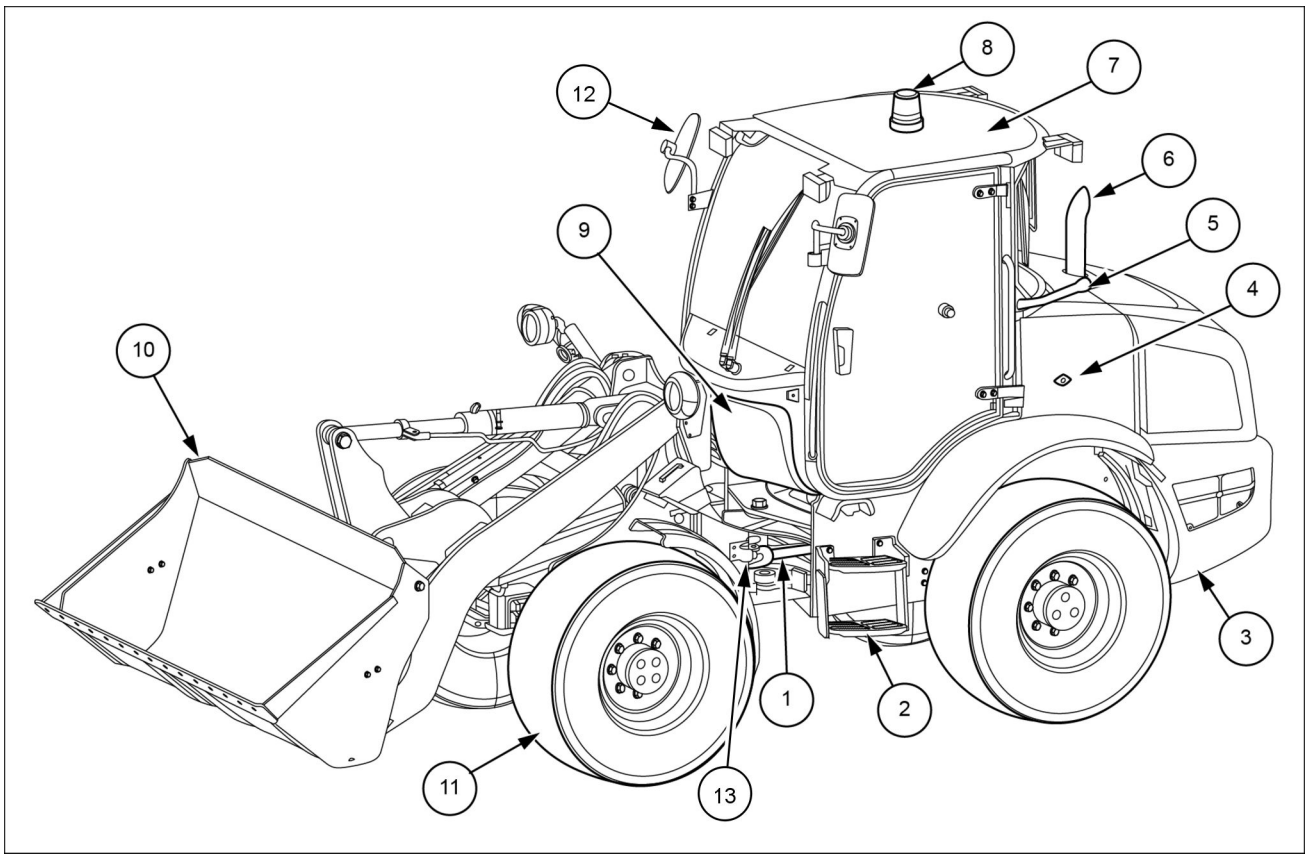
Identification of machine components

Left-hand side

Left-hand side



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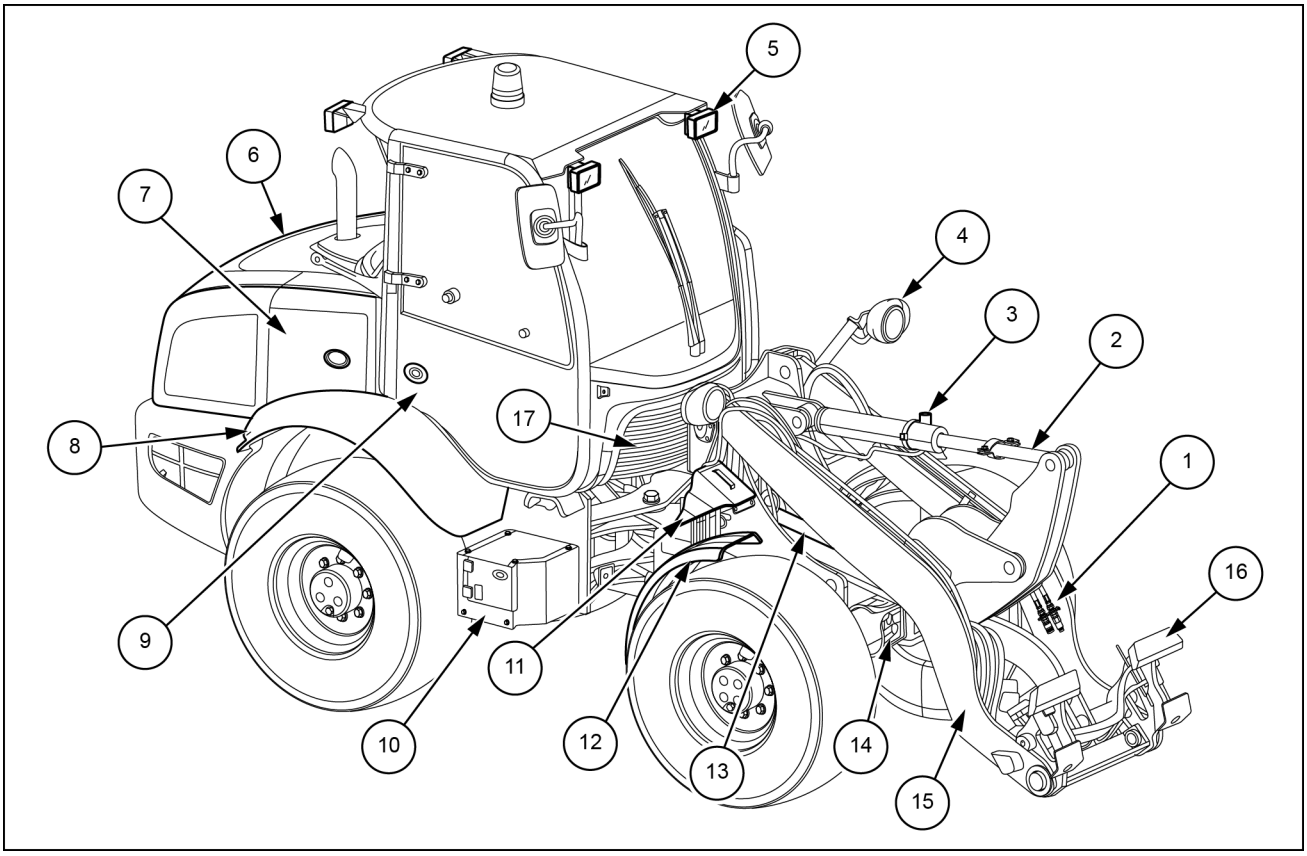
1. Steering cylinder
2. Access steps to cab (one step for W50C and W60C)
3. Counterweight
4. Fuel tank and engine coolant reservoir access
5. Cab door locking pin
6. Final tail
7. Roll Over Protection Structure (ROPS) and Falling Objects Protective Structure (FOPS) cab (standard or deluxe cab)
8. Rotary beacon (optional)
9. Cab air filter access
10. Bucket
11. Wheels
12. Mirrors
13. Transport safety pin

Right-hand side



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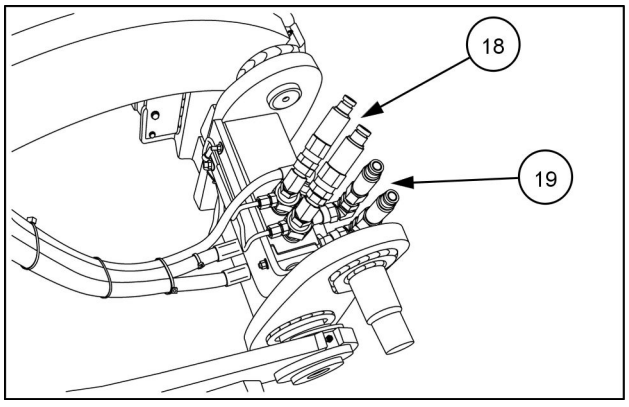
1. High Flow (optional)
2. Tilt cylinder
3. Return-to-dig (optional)
4. Driving lights
5. Work lights (optional)
6. Engine hood
7. Hydraulic oil tank access panel
8. Rear fender
9. Fuse and relay access
10. Battery compartment
11. Wheel chocks
12. Front fender
13. Lift cylinders
14. Axles
15. Lift arm
16. Quick Coupler (Skid Steer Loader version)
17. Brake oil tank access panel

18. 3rd hydraulic function (Horizontal Pin version)
19. 4th hydraulic function (Horizontal Pin version)



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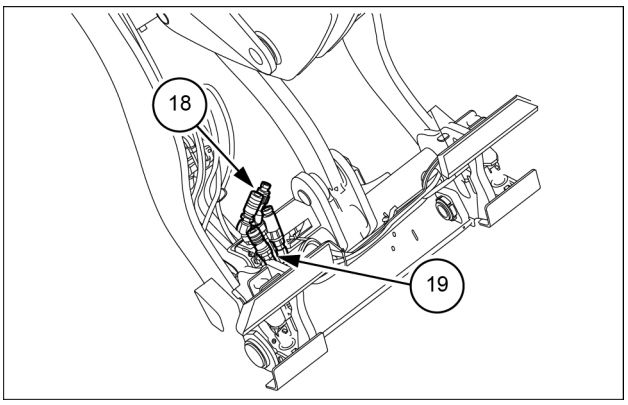
18. 3rd hydraulic function (Skid Steer Loader version)
19. 4th hydraulic function (Skid Steer Loader version)



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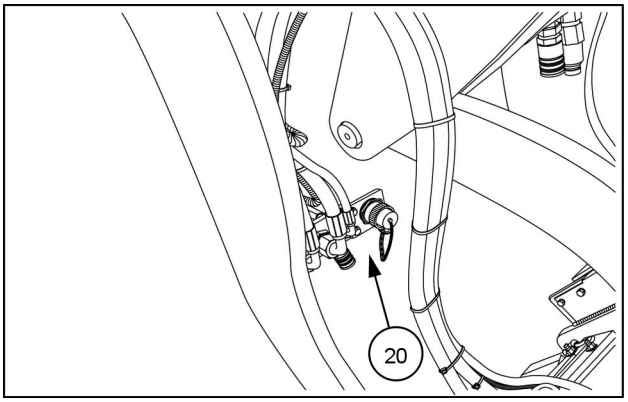
20. Front electrical socket (optional)



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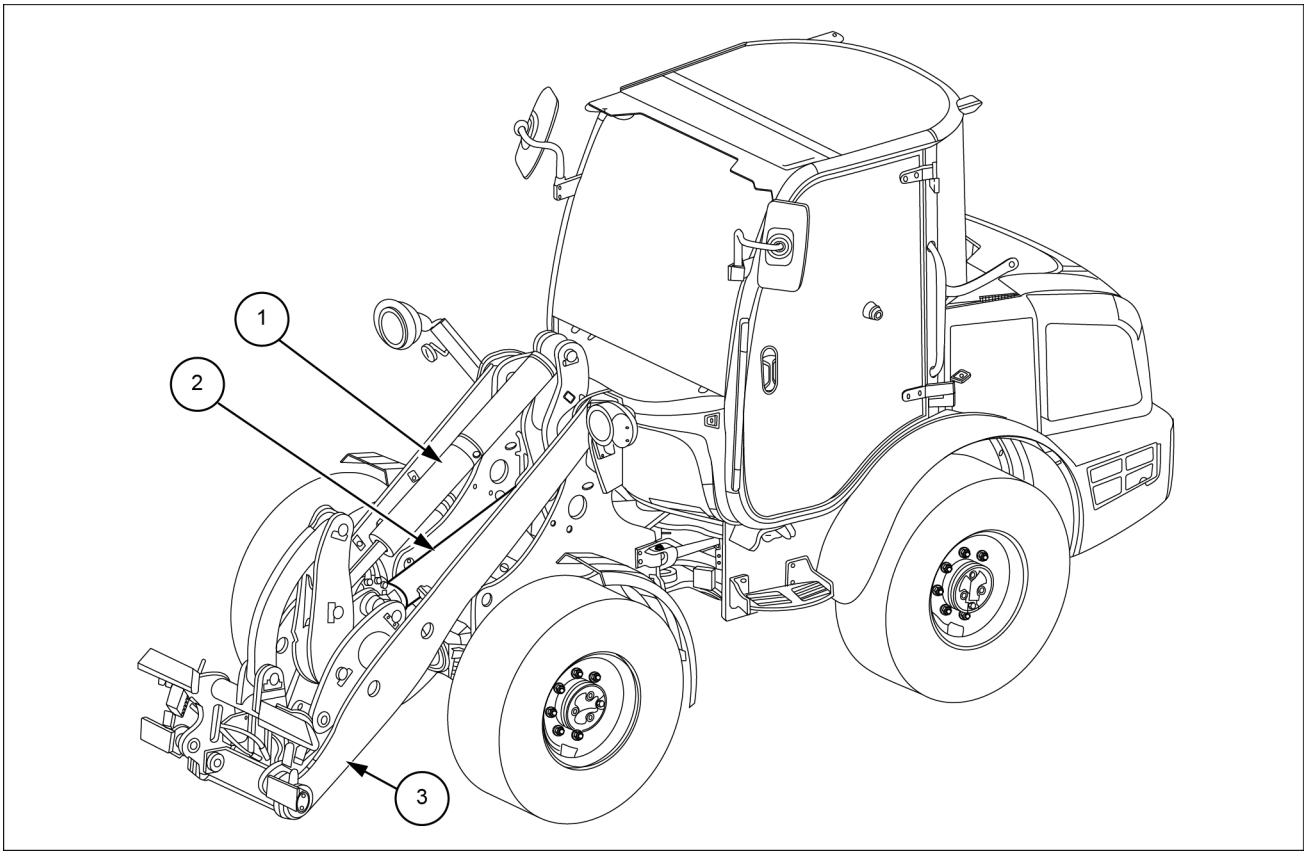
XT version



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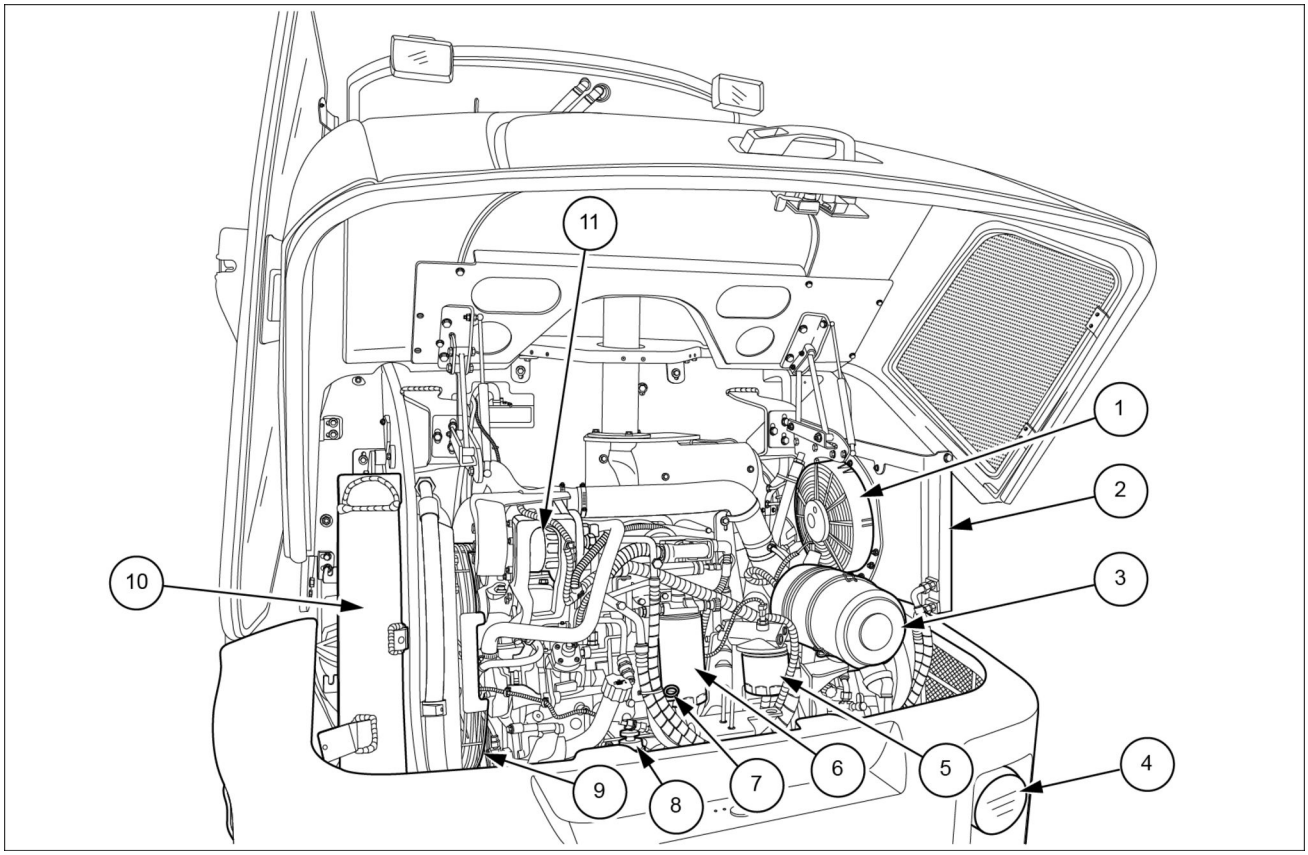
1. Tilt cylinder
2. Lift cylinder
3. Lift arms

Engine compartment



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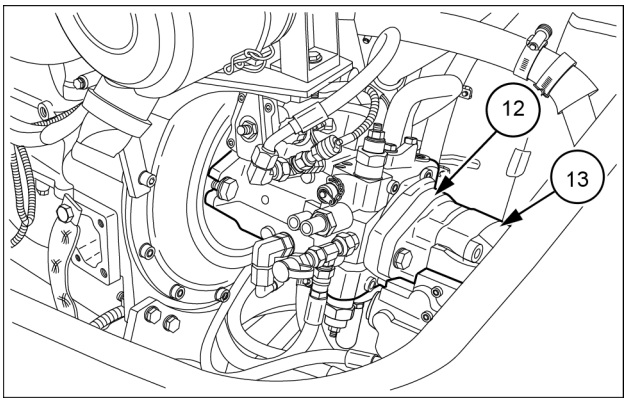
1. Condenser fan (optional)
2. Air-conditioning condenser (optional)
3. Engine air filter
4. Rear driving lights
5. Engine oil filter
6. Fuel filter
7. Oil dipstick
8. Fuel prefilter
9. Engine fan
10. Engine cooler
11. Air-conditioning compressor (optional)

12. Hydrostatic pump
13. High Flow pump (optional)



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2 - SAFETY INFORMATION

Safety rules and signal word definitions

Personal safety

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible death or injury.

Throughout this manual and on machine safety signs, you will find the signal words DANGER, WARNING, and CAUTION followed by special instructions. These precautions are intended for the personal safety of you and those working with you.

Read and understand all the safety messages in this manual before you operate or service the machine.

⚠ DANGER indicates a hazardous situation that, if not avoided, will result in death or serious injury. The color associated with DANGER is RED.

⚠ WARNING indicates a hazardous situation that, if not avoided, could result in death or serious injury. The color associated with WARNING is ORANGE.

⚠ CAUTION indicates a hazardous situation that, if not avoided, could result in minor or moderate injury. The color associated with CAUTION is YELLOW.

FAILURE TO FOLLOW DANGER, WARNING, AND CAUTION MESSAGES COULD RESULT IN DEATH OR SERIOUS INJURY.

Machine safety

NOTICE: *Notice indicates a situation that, if not avoided, could result in machine damage or property damage. The color associated with Notice is BLUE.*

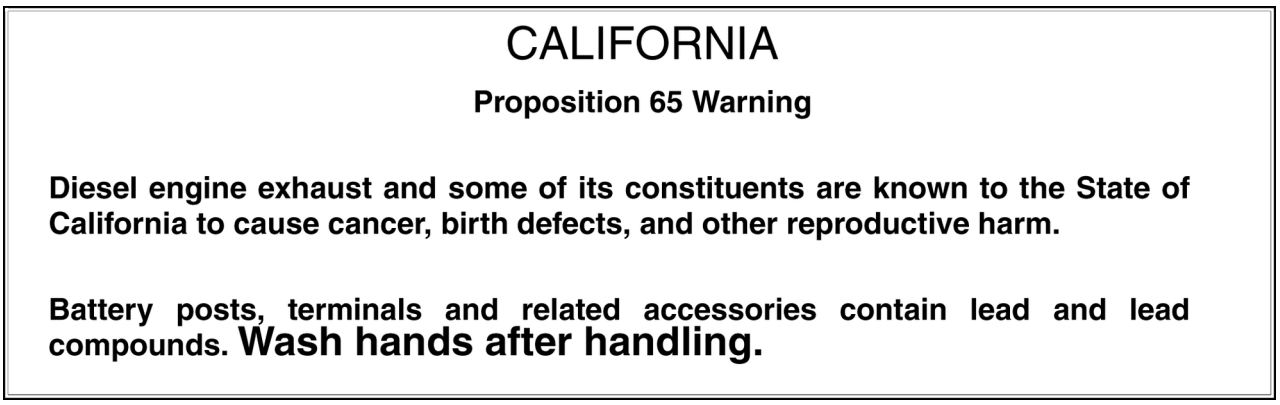
Throughout this manual you will find the signal word Notice followed by special instructions to prevent machine damage or property damage. The word Notice is used to address practices not related to personal safety.

Information

NOTE: *Note indicates additional information that clarifies steps, procedures, or other information in this manual.*

Throughout this manual you will find the word Note followed by additional information about a step, procedure, or other information in the manual. The word Note is not intended to address personal safety or property damage.

Safety rules — California Proposition 65 Warning



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California Proposition 65 Warning

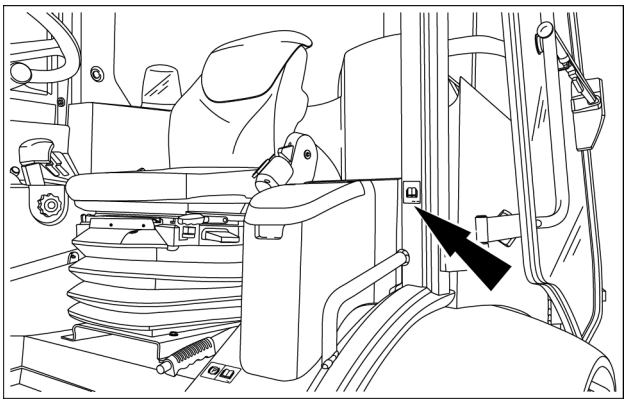
Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

Battery posts, terminals and related accessories contain lead and lead compounds. Wash hands after handling.

Personal safety

Most accidents involving machine operation and maintenance can be avoided by following basic safety rules and precautions. Read and understand all the safety messages in this manual, the safety manual and the safety signs on the machine before you operate or service the machine. See your dealer if you have any questions.

READ THIS MANUAL COMPLETELY and make sure you understand the controls. All equipment has a limit. Make sure you understand the speed, brakes, steering, stability, and load characteristics of the machine before you start to operate this machine.



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DO NOT remove this manual or the safety manual from the machine. See your dealer for additional manuals. Also see the manual information on the Title pages (first and second pages in front of the Table of Contents) of this manual.

The safety information given in this manual does not replace safety codes, insurance needs, federal, state, or local laws. Make sure that your machine has the correct equipment according to these rules or laws.

Additional safety messages are used in the text of the manual to show specific safety hazards.

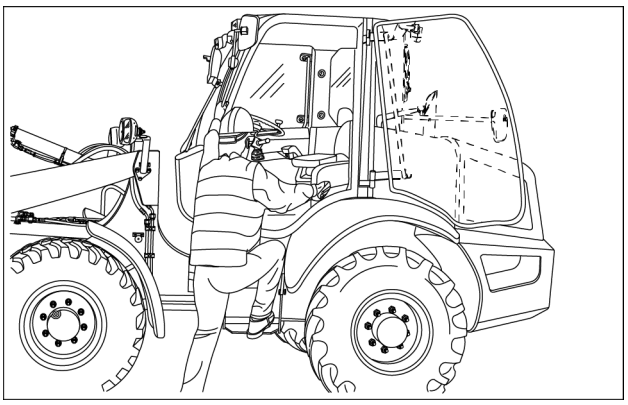
NOTICE: *the safety messages in this chapter point out conditions which can happen during the normal operation and maintenance of your machine. These safety messages also give possible ways of dealing with these conditions.*

Safety rules

- It is the responsibility of the operator to read and understand the Operator's Manual and other information provided, and use the correct operating procedure. Machines should be operated only by qualified operators.
- Do not operate this machine or perform maintenance work if you have not had appropriate training. Read and fully understand all the instructions and warnings in this manual.
- Be prepared for emergencies. Always have a first aid kit and a working fire extinguisher with you and know how to use each.
- Avoid loose fitting clothing, loose or uncovered long hair, jewelry and loose personal articles.
- Know and use the protective equipment that is to be worn when operating this machine. Hard hats, protective glasses, protective shoes, gloves, reflector type vests, respirators and ear protection are examples of equipment that may be required.
- Certain protective equipment should be replaced and renewed upon age and wear. Old hard hats may not afford the original intended protection. Faded and soiled vests are no longer as highly visible as the original intent. See the manufacturer's recommendation.
- Know and use the hand signals required for particular jobs and know who has the responsibility for signaling.
- Wear the seat belt to maximize the protection capability of a ROPS (Roll Over Protective Structure)/FOPS (Falling Objects Protective Structure) when the machine is so equipped.
- Inspect the ROPS/FOPS and seat belt mounting bolts on a daily basis to insure their integrity.
- Do not permit riders on the machine if there is no manufacturer's designated place for a rider.
- Make sure that all protective guards, canopies, doors, etc. are in place and secure.
- Remove all loose objects stored in the machine. Remove all objects which do not belong in or on the machine and its equipment.
- At each key ON make sure of the functioning of the acoustic signals coming from the buzzer of the instrument cluster. If no acoustic signal is heard, the use of the Quick Coupler is forbidden and contact an authorized dealer for a cluster check. In case, require a replacement.

Getting on and off the machine

- Use the recommended hand holds and steps with at least three points of support when getting on and off the machine. The door must be latched and secured in the open position before using the door hand hold. Keep steps and platform clean. Face the machine and use the hand holds and steps adhering to a three-point access system when climbing up and down.
- Do not jump off the machine.
- Do not dismount while the machine is in motion.
- Foreign material or grease on the steps and hand rails can cause an accident. Keep the steps and hand rails clean.



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Starting and stopping precautions

- Walk around the machine and warn all personnel who may be servicing the machine or are in the machine path prior to starting. Do not start until all personnel are clearly away from the machine. Sound the horn, if equipped, before starting.
- Walk around the machine's tool, attachment, or furthermost contact point to view operation danger area from the work site personnel's view and angle.
- Check that the parking brake is applied, place the transmission in neutral or park as specified by the manufacturer, and disengage the PTO, if so equipped, before starting the machine.
- Adjust, secure and latch the seat and fasten the seat belt before starting the machine.
- Start and operate the machine only from the operator's station.
- Do not bypass the machine's neutral-start system. The neutral-start system must be repaired if it malfunctions.
- Use battery booster cables only in the recommended manner. Improper use can result in battery explosion or unexpected machine motion. Ventilate the battery area before using booster cables. Make sure that using jumper cables will not interfere or harm electronic processing or computer devices.
- Do not operate the engine in an enclosed area without adequate ventilation.
- Park the machine on level ground whenever possible and apply the parking brake. On grades, park the machine with the wheels or track securely blocked.
- Before leaving the operator's station, lower the bucket/attachment to the ground and shut off the engine.
- Remove the starter key and/or use the disconnect switch when leaving the machine parked or unattended.

Operating precautions

- Check brakes, steering and other machine control devices in accordance with the manufacturer's instructions prior to starting operation. Observe all gauges or warning instruments for proper operation. Operate all controls to insure proper operation. If any malfunctions are found, remove the starter key or disconnect switch key. Place a DO NOT OPERATE tag on the machine until the malfunction is corrected.
- If a failure that causes loss of control such as steering, service brakes, or engine occurs, stop the machine motion as quickly as possible, remove the starter key or disconnect switch key. Place a DO NOT OPERATE tag on the machine, and keep it securely parked until the malfunction is corrected or the machine can be safely towed.
- Understand the machine limitations, and keep the machine under control.
- Operate and drive the machine with care and at speed compatible with conditions. Use extra caution when operating over rough ground, on slopes, and when turning.
- Note and avoid all hazards and obstructions such as ditches, underground lines, trees, cliffs, overhead electrical wires, or areas where there is danger of a slide.
- Carry loads in recommended positions for maximum stability.
- Never lift loads in excess of capacity.
- Use the recommended machine ballast and counterweighting.
- Know and understand the job site traffic flow patterns and obey signalmen, road signs, and flagmen.
- Know and understand that job site conditions may change on an hourly basis. Hills of dirt, debris or obstructions may grow and change from the time you began the day. It is your responsibility to monitor the changes and keep the machine, tools and attachments, etc. a safe distance.
- Watch for bystanders and never allow anyone to be under or to reach through the machine and its equipment while operating.
- Select a gear that will prevent excessive speed when going downhill. Do not coast downhill.
- When roading a machine, know and use the signaling devices required on the machine. Provide an escort for roading where required.
- Use the recommended transport devices when roading the machine. Proper lights, flashers, signals, and beacons may be required. Use reflective slow moving vehicle signs where necessary. Follow local, state, and federal regulations.
- Use the approved drawbar and/or attachment point when using the machine for towing. If a cable or chain is used, keep people away from the tow line.
- Before you operate at night, check that all lamps illuminate.
- If your machine has a cab, make sure that all windows are clean and that the windshield wipers and washers work correctly.
- Engine exhaust fumes can cause death. If you operate this machine in an enclosed area, make sure there is ventilation to replace the exhaust fumes with fresh air.
- Check all controls in a clear area and make sure the machine is operating correctly. Dust, fog, smoke, etc., can decrease your vision and cause an accident. Stop the machine or decrease the speed until you can see.
- Contact with high voltage power lines, underground cables, etc., can cause serious injury or death from electrocution.
- Before you drive or operate in an area with high voltage lines, cables, or a power station, tell the power or utility company what you are going to do. You MUST HAVE THE POWER DISCONNECTED OR KEEP A SAFE WORKING DISTANCE from the lines, cables, or power station.
- Keep all parts of the machine a safe distance away from the power source. You must also know any federal, state/provincial, or local safety codes or regulations that apply to the job site.
- If a part of the machine touches high voltage power:
  1. Warn other workers NOT TO TOUCH THE MACHINE and to stay away from the machine.
  2. If you can break contact, reverse the operation that caused contact with the high voltage power, and move the machine away from the danger area. If you cannot break contact stay in the machine until the utility company de-energizes the line and tells you that the power is off.
- If you have extreme conditions, such as a fire, etc., and you are forced to leave the machine, do not step off the machine. Jump as far from the machine as possible with your feet together and do not touch the ground with your hands.

- Do not operate the machine if you do not feel well. This can be dangerous for you and for the people around you.
- You must make a judgment if weather, road, or earth conditions will permit safe operation on a hill, ramp, or rough ground.
- Stay away from hazardous areas such as ditches, overhangs, etc. Walk around the work area before you start and look for hazards.
- Be alert and always know the location of all workers in your area. Keep all other persons completely away from your machine. Injury or death can result if you do not follow these instructions.
- Develop fluid and smooth operating techniques, and maintain the surface condition where the machine travels in order to control vibration transfer to the operator.

Maintenance precautions

- Do not attempt repairs unless trained. Refer to manuals and experienced repair personnel for help.
- Before you service the machine, always place a DO NOT OPERATE tag on the key switch. Make sure that the machine is clearly “tagged out”.
- Wear protective glasses and other required safety equipment when servicing or repairing the machine.
- Wear gloves to protect hands when handling cable.
- Disconnect the battery before working on the electrical system. Know the consequences of disconnecting any electronic or computer devices.
- Avoid lubrication or mechanical adjustments with the machine in motion or the engine operating. If the engine must be in operation to make certain adjustments, place the transmission in neutral, apply the parking brake, place the bucket/attachment in a safe position, securely block the wheels and use extreme caution.
- Securely block the machine or any component that may fall before working on the machine or component. If possible, use a back up or secondary blocking device as well.
- To prevent unexpected movement, securely block working elements when repairing or changing working tool parts such as cutting edges.
- Never make repairs on pressurized components, fluid, gas or mechanical until the pressure has been relieved according to the manufacturer’s instructions.
- Use extreme caution when removing radiator, reservoir, or tank caps, drain plugs, grease fittings or pressure taps. Park the machine and let it cool before opening a pressurized tank.
- Release all pressure before working on systems which have an accumulator.
- Hydraulic oil or diesel fuel leaking under pressure can penetrate the skin and cause infection or other injuries. To prevent personal injury, relieve all pressure before disconnecting fluid lines or performing work on the hydraulic system. Before applying pressure, make certain all connections are tight and components are in good condition.
- Use a piece of cardboard, newspaper, or wood to check for any pressurized leaks to prevent fluid penetrating the skin. Pressurize accumulators with the proper gas according to manufacturer’s recommendations.
- When inflating tires, use a self-attaching inflation chuck with remote shutoff and stand clear of the tire. Position yourself beside the tire and not beside the rim.
- Towing this machine is not recommended.
- When absolutely necessary to tow the machine, do not exceed the recommended towing speed. Be sure the towing machine has sufficient braking capacity to stop the towed load. If the towed machine cannot be braked, a tow bar must be used or two towing machines must be used - one in front pulling and one in the rear to act as a brake. Avoid towing over long distances.
- Always observe proper maintenance procedures.
- Always replace all missing, illegible or damaged safety signs or decals as necessary. Keeps all safety signs and decals clean and legible.

Observe proper maintenance procedures

- Whenever servicing or replacing hardened pins, etc., use a brass drift or other suitable material between the hammer and the pin. Alt: Use a brass hammer, drift or suitable material on the pin, etc.
- Keep the brakes and steering systems in good operating condition.

Fuel handling

- Do not smoke or permit open flames while fueling or near fueling operations.
- Never remove the fuel cap or refuel machines with the engine running or the engine hot. Never allow fuel to spill on hot machine components. Avoid spilling fuel on the ground or contaminating the environment.
- Always maintain control of the fuel filter nozzle when filling the tank. This will help avoid spilling fuel.
- Clean up spilled fuel immediately and dispose of all contaminated material in an environmentally correct manner.
- Tighten the fuel tank cap securely. In the event that the fuel cap is lost, replace it only with the manufacturer's approved cap. Use of a non-approved cap without proper venting may result in pressurization of the tank.
- Never use gasoline for cleaning purposes.
- Use the correct fuel for the operating season.

Burn prevention

⚠ WARNING

Battery acid causes burns. Batteries contain sulfuric acid.
Battery electrolyte contains sulfuric acid. Contact with skin and eyes could result in severe irritation and burns. Always wear splash-proof goggles and protective clothing (gloves and aprons). Wash hands after handling.
Failure to comply could result in death or serious injury.

W0120A

⚠ CAUTION

Burn hazard!
Hot coolant can spray out if you remove the filler cap while the system is hot. After the system has cooled, turn the filler cap to the first notch and wait for all pressure to release before proceeding.
Failure to comply could result in minor or moderate injury.

C0043A

- When the battery electrolyte is frozen, the battery can explode if, you try to charge the battery, or if you try to boost start and run the engine. To prevent the battery electrolyte from freezing, try to keep the battery at full charge. If you do not follow these instructions, you or others in the area can be injured.
- Hot coolant can spray out if the cooling system cap is removed. To remove the cap, let the cooling system cool, turn to the first notch, wait until the pressure is released, then remove the cooling system tank cap.

Hazardous chemicals

- If you are exposed to, or come in contact with, hazardous chemicals you can be seriously injured. The fluids, lubricants, paints, adhesives, coolants, etc. required for the function of the machine can be hazardous. They may be attractive and harmful to domestic animals as well as humans.
- Material Safety Data Sheets (MSDS) provide information about chemical substances within a product, safe handling procedures, first aid measures, and procedures to be taken in the event of a spill or accidental release. MSDS are available from your dealer.
- Before you service the machine, check the MSDS for each lubricant, fluid, etc. used in the machine. This information indicates the associated risks and will help you service the machine safely. Follow the information in the MSDS, on manufacturer's containers, as well as the information in this manual when servicing the machine.
- Dispose of all fluids, filters, and containers in an environmentally safe manner according to local laws and regulations. Check with local environmental and recycling centers or your dealer for correct disposal information.
- Store fluids and filter in accordance with local laws and regulations. Use only appropriate containers for the storage of chemicals or petrochemical substances.
- Keep out of reach of children or other unauthorized persons.

Transporting precautions

- Know the rules, laws, and safety equipment necessary for transporting this machine on a road or highway.
- Use appropriate lighting as defined by local regulations. Make sure the slow moving vehicle (SMV) and or speed indicator (SIS) is visible if driving on a public road or highway.

Fire extinguisher

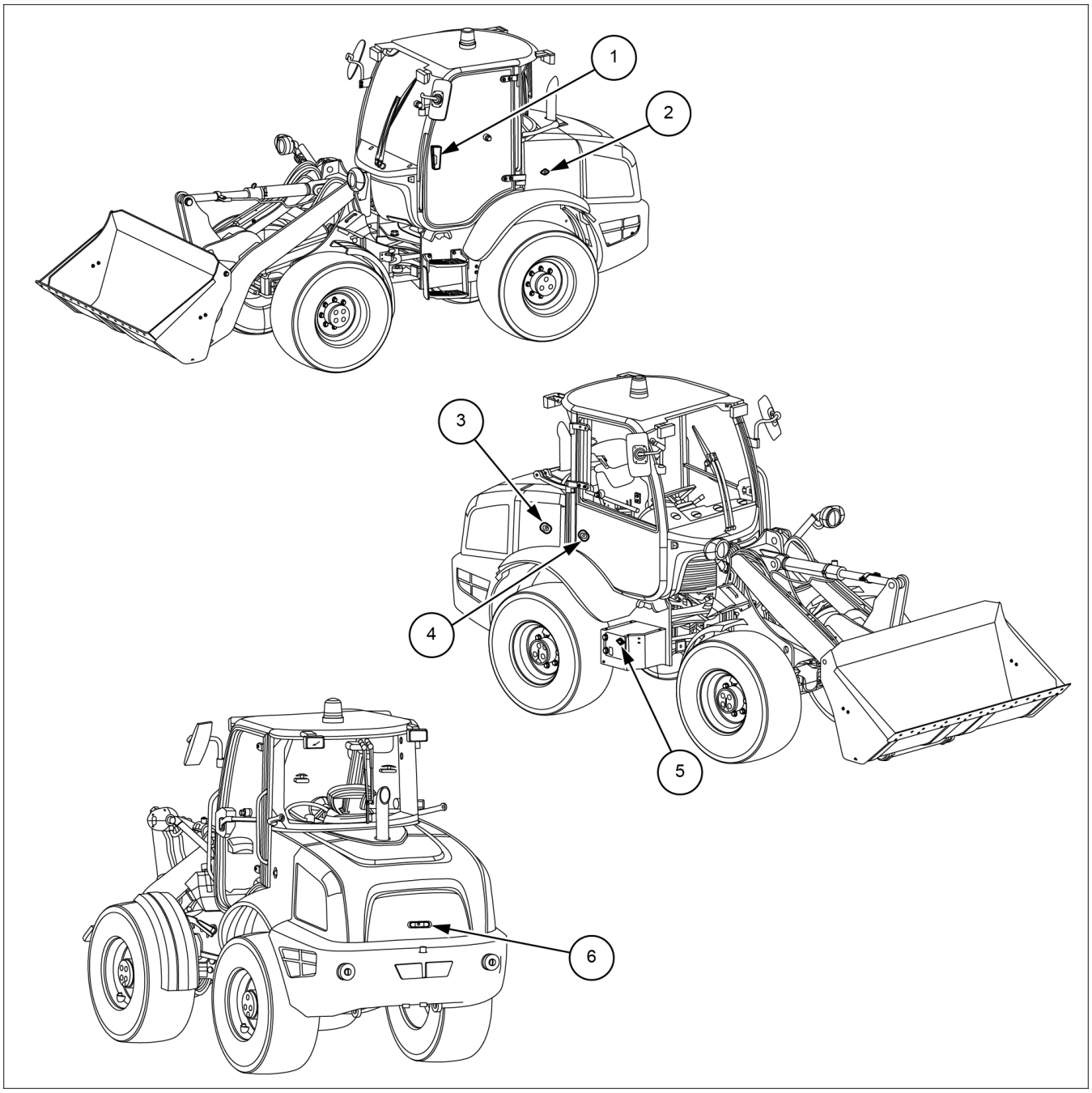
- A fire extinguisher on board is recommended for all construction equipment.
- Contact your dealer for the type and location of a fire extinguisher for this machine.

Precautions specific to this machine

- Keep the load or bucket/attachment as low as possible while moving the machine around the job site.
- You must know which circuits have accumulators and how to release pressure properly.
- When servicing the machine, turn the machine off, release hydraulic pressure, keep the attachment on the ground, and set the parking brake.
- If the machine must be serviced with the lift arm up, always use the lift arm support strut with the bolt turned completely in.

Driving on public roads and general transportation safety

Safety features and optional vehicle security



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1. Cab door: it can be locked with a key
2. Fuel tank access panel: it can be locked with a key
3. Hydraulic oil tank access panel: it can be locked with a key
4. Fuse and relay access door: it can be locked with a key
5. Battery compartment: it is located on the right-hand side of the machine. The batteries and battery main switch are located inside the battery compartment.
6. Engine compartment: it can be locked with a key.

Road travel requirements - in cab

⚠ WARNING

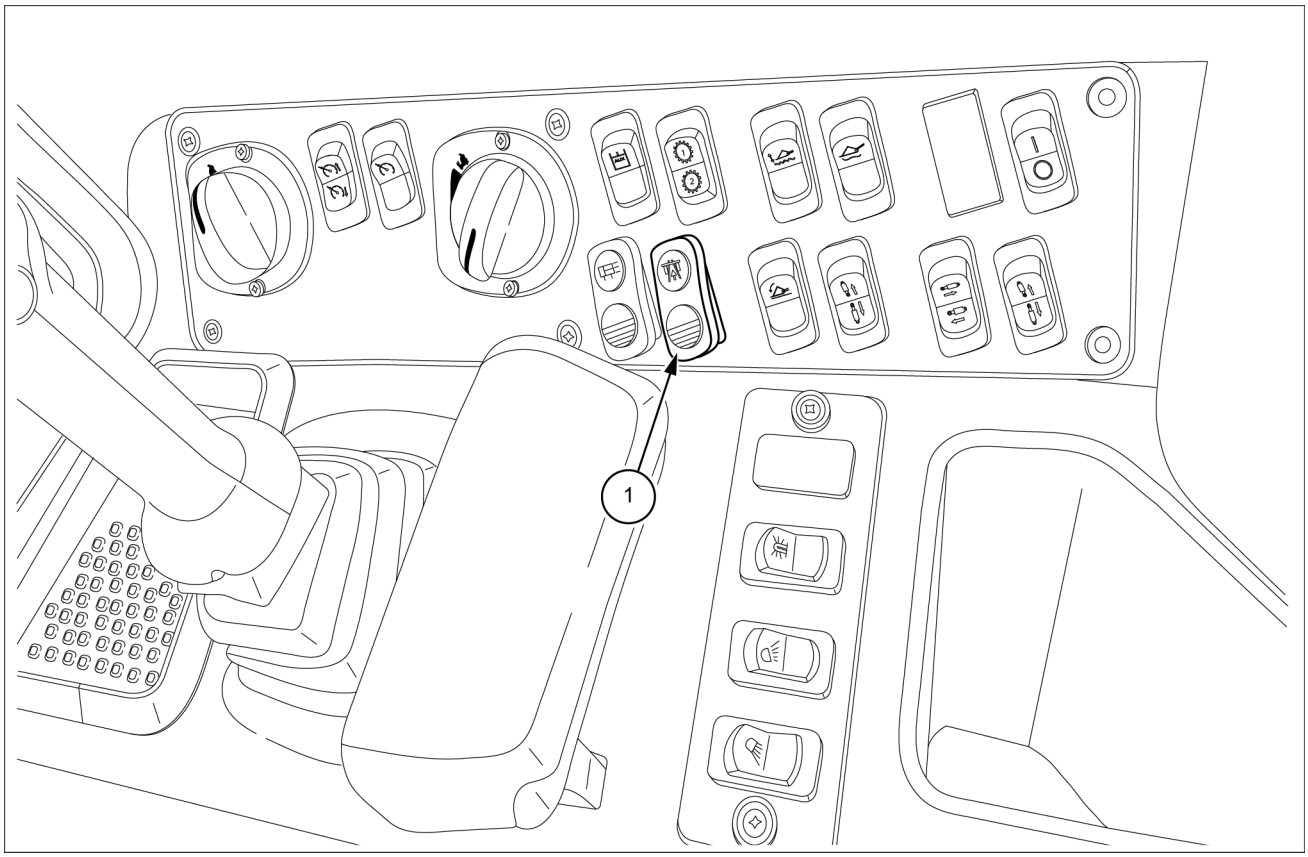
Equipment failure could cause accident or injury!
Always fasten the seat belt securely before you operate the machine. Inspect seat belt parts for wear and damage. Replace any and all worn or damaged parts of the seat belt prior to operation.
Failure to comply could result in death or serious injury.

W0046C

⚠ WARNING

Transport hazard!
Observe the local government regulations when driving on public roads.
Failure to comply could result in death or serious injury.

W1019A



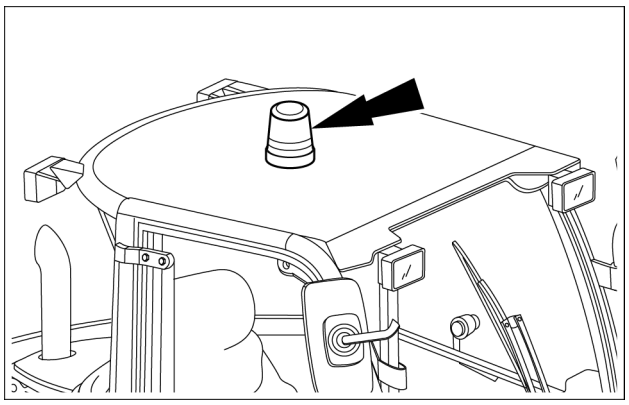
LEIL15CWL0139FB 2

1. ROAD MODE: disable the main hydraulic when travelling on road.
   Locate the “Road mode” enable switch **(1)** on the dashboard in the right-hand side console, in the operator’s compartment.
   The Road mode” enable switch **(1)** is secured by a mechanical lock against a possible accidental activation. To unlock the Road mode” enable switch **(1)** from the mechanical lock, pull slightly the lock towards the operator. Then press on the symbol face of the Road mode” enable switch **(1)** to disable the main hydraulic.

Always fasten your seat belt before travelling on road.

ROTARY BEACON

The rotary beacon must always be in operation when travelling on road by day and/or night.



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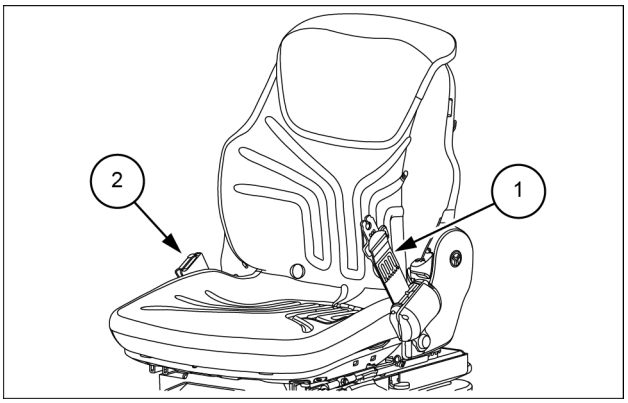
Seat belts

⚠ WARNING

Roll-over hazard!
Securely fasten the seat belt. Your machine is equipped with a Roll-Over Protective Structure (ROPS) cab, ROPS canopy, or ROPS frame for your protection. The seat belt can help ensure your safety if it is properly used and maintained. Never wear a seat belt loosely or with slack in the belt system. Failure to comply could result in death or serious injury.

W0143A

1. Insert the metal end of the left-hand belt strap **(1)** into the latch mechanism **(2)** on the right-hand side of the seat.
2. Tighten the seat belt by pulling on the loose end of the left-hand seat belt.



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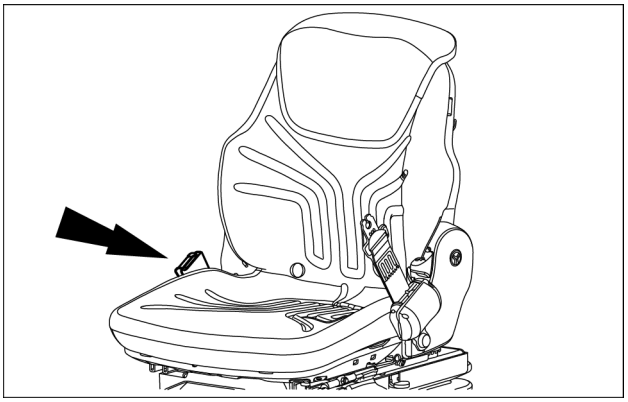
1. To unlatch the seat belt, press the red button on the right-hand side mechanism.



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Cab protection structure (ROPS/FOPS)

⚠ WARNING

Misuse hazard!
Your machine is equipped with an operator protective structure. DO NOT weld, drill holes, attempt to straighten, or repair the protective structure. Modification in any way can reduce the structural integrity of the structure.
Failure to comply could result in death or serious injury.

W0001B

NOTICE: *for total operating safety, the machine's cab is designed to prevent flames from propagating in the event of a fire and to limit combustion as required by* ***ISO 3795****.*

This machine is provided with a cab protective structure complying with:

- **ISO 3471**: 2008 (ROPS)
- **ISO 3449**: 2005 (FOPS LEVEL II)

The cab protection structure is a special safety system of your machine.

DO NOT connect any towing device to the cab protection structure. DO NOT make holes in the cab protection structure.

The cab protection structure and the respective components for assembly and for fixing it to the machine, are a certified system. Damage due to fire, corrosion or tampering could weaken the structure, reducing its efficacy and threatening your safety. If damaged, the cab protection structure must be replaced so as to restore the original safety standards. Contact your Dealer to check the functionality of the structure or if it has to be changed.

After a collision, fire or overturning, before resuming normal work operations, the following operations must be carried out by a qualified technician:

- Replacement of the cab protection structure.
- Accurate inspection of the supports for fitting the protection structure, the driver's seat and its support, the safety belts and their fixtures, the electric system inside the protection structure.
- All damaged parts MUST be replaced.

Transport safety pin and support strut

Transport safety pin

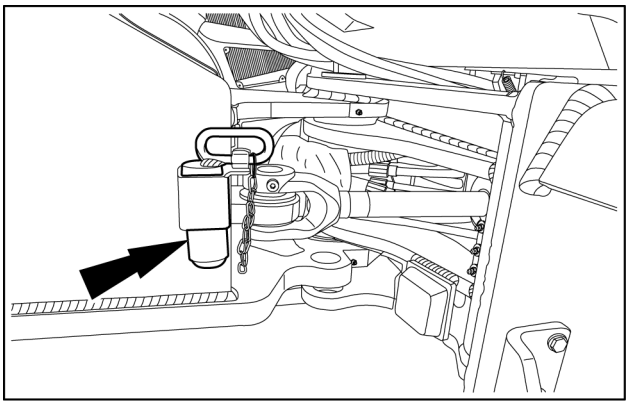
⚠ WARNING

Crushing hazard!
Engage the safety lock link before service or transport.
Failure to comply could result in death or serious injury.

W1154A

Prior to any maintenance, service work or transportation, lock the articulation transport safety pin.

1. Remove the transport safety pin from the support located on the left-hand side or on the right-hand side of the machine.



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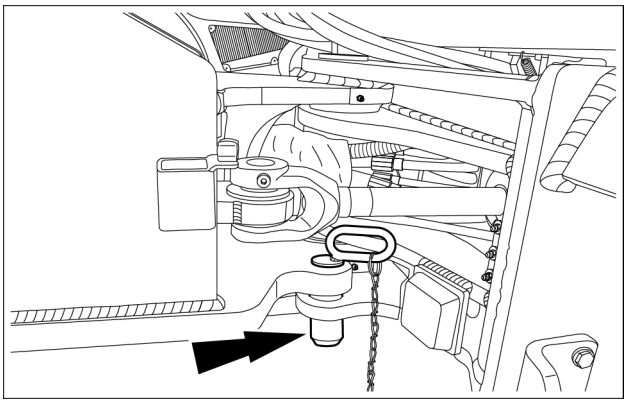
2. Insert the transport safety pin in the hole of the holders of the frame, so that the articulation joint is locked.



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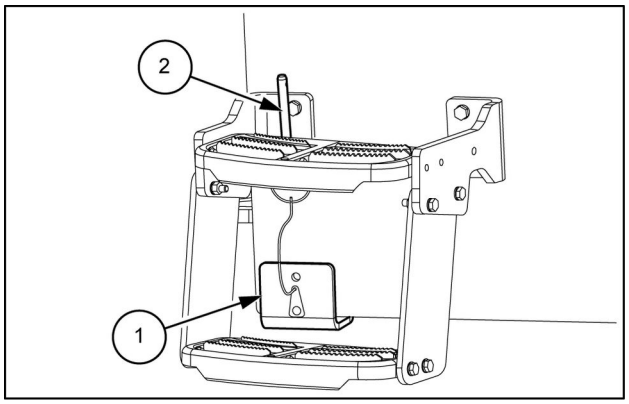
Road travel or transport

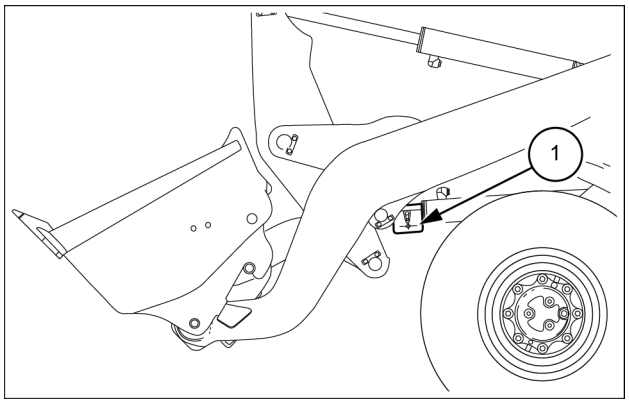
Always use the support strut in road mode:

1. Empty the bucket, raise the bucket to approximately **0.7 m** (**2.3 ft**) and rollback the bucket. Stop the engine. Locate the support strut **(1)** on the left-hand side of the machine, behind the steps.
   Remove the retaining pin **(2)** to remove the support strut **(1)** from its housing.



LEIL14CWL0466AB 3

2. Place the support strut **(1)** on the lift cylinder rod. Install the retaining pin **(2)** to lock in place the support strut **(1)**. Slowly lower the lift arm onto the support strut **(1)**.



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NOTE: *use the dedicated support strut for High Tip buckets, Side Dump buckets and all the special attachments.*

Utility safety

⚠ WARNING

Electrical shock hazard!
Do not work under overhangs or electric wires. Do not work where there is a danger of sliding.
Failure to comply could result in death or serious injury.

W0215A

Safety precautions must be followed when working near buried and overhead utility lines.

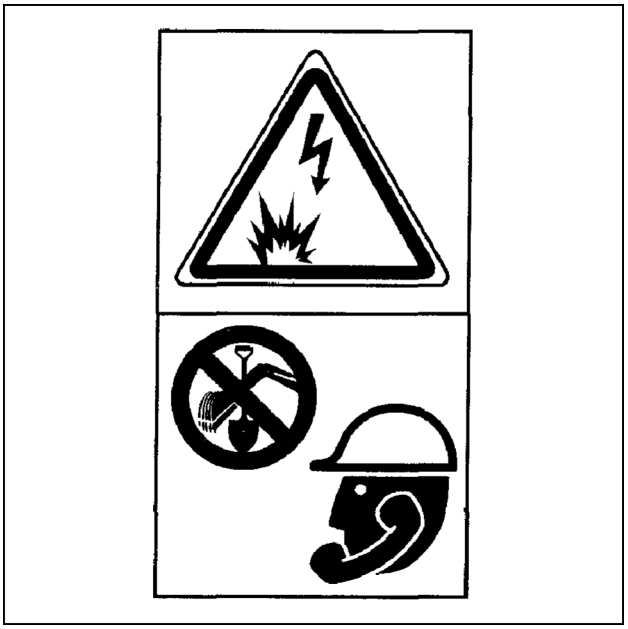
During operation it is likely that you will be working around or near buried or overhead utility lines which may include, but are not limited to:

- Electrical power line
- Gas line
- Water line
- Communication line - telephone or cable television
- Sewer line

NOTICE: *before beginning any machine operation, it is your responsibility to be aware of all such utility lines buried and overhead in the area of your project and to avoid them.*

Always have all local utility companies mark the location of their lines.

NOTICE: *check with local authorities for laws, regulations and/or strict penalties requiring you to locate and avoid existing utilities.*



RCPH10WHL001BAH 1

Call all local utility companies before you perform any machine operation

Know the utility color code :	
Electric	Red
Gas, oil, or petroleum	Yellow
Communication, telephone, television	Orange
Water	Blue
Sewer	Green/Brown
Proposed excavation	White
Surveying	Pink
Reclaimed water and slurry	Purple

After locating any buried utility lines, carefully dig a hole by hand and/or automatic vacuum equipment to the utility line to verify the location and depth of the line.

Ecology and the environment

Soil, air, and water quality is important for all industries and life in general. When legislation does not yet rule the treatment of some of the substances that advanced technology requires, sound judgment should govern the use and disposal of products of a chemical and petrochemical nature.

NOTE: *the following are recommendations that may be of assistance:*

- Familiarize yourself with the relative legislation applicable to your country, and make sure that you understand this legislation.
- Where no legislation exists, obtain information from suppliers of oils, filters, batteries, fuels, anti-freeze, cleaning agents, etc., with regard to the effect of these substances on man and nature and how to safely store, use, and dispose of these substances. Your CASE CONSTRUCTION dealer can also provide assistance.

Helpful hints

- Avoid the use of cans or other inappropriate pressurized fuel delivery systems to fill tanks. Such delivery systems may cause considerable spillage.
- In general, avoid skin contact with all fuels, oils, acids, solvents, etc. Most of these products contain substances that may be harmful to your health.
- Modern oils contain additives. Do not burn contaminated fuels and or waste oils in ordinary heating systems.
- Avoid spillage when you drain fluids such as used engine coolant mixtures, engine oil, hydraulic fluid, brake fluid, etc. Do not mix drained brake fluids or fuels with lubricants. Store all drained fluids safely until you can dispose of the fluids in a proper way that complies with all local legislation and available resources.
- Do not allow coolant mixtures to get into the soil. Collect and dispose of coolant mixtures properly.
- Do not open the air-conditioning system yourself. It contains gases that should not be released into the atmosphere. Your CASE CONSTRUCTION dealer or air-conditioning specialist has a special extractor for this purpose and can recharge the system properly.
- Repair any leaks or defects in the engine cooling system or hydraulic system immediately.
- Do not increase the pressure in a pressurized circuit as this may lead to a component failure.
- Protect hoses during welding. Penetrating weld splatter may burn a hole or weaken hoses, allowing the loss of oils, coolant, etc.

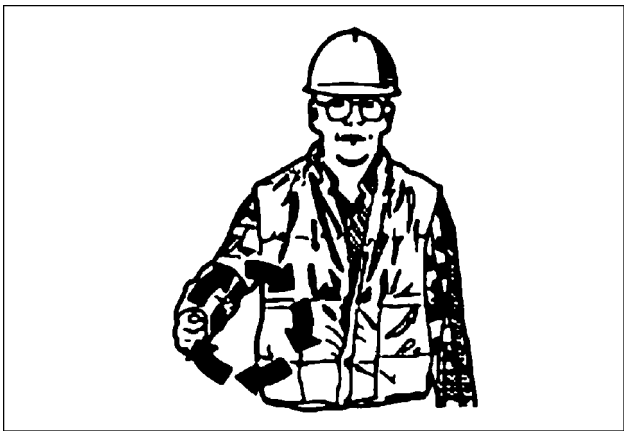
Battery recycling

Batteries and electric accumulators contain several substances that can have a harmful effect on the environment if the batteries are not properly recycled after use. Improper disposal of batteries can contaminate the soil, groundwater, and waterways. CASE CONSTRUCTION strongly recommends that you return all used batteries to a CASE CONSTRUCTION dealer, who will dispose of the used batteries or recycle the used batteries properly. In some countries, this is a legal requirement.

Hand signals

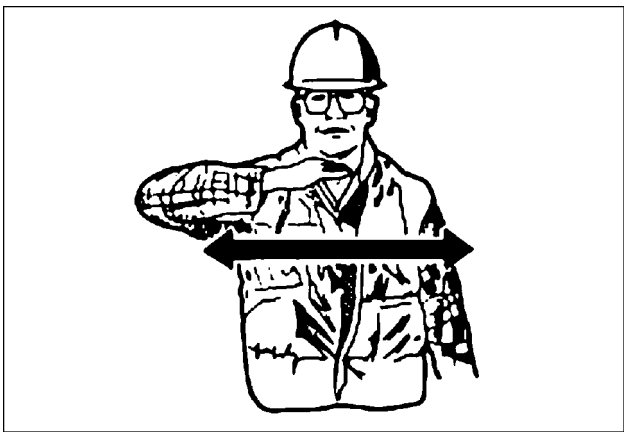
When operating the machine, never attempt to carry out tasks calling for fine control or to work in areas where visibility is poor or impaired without seeking the assistance of a signal person. Make perfectly sure that you and the signal person understand the signals to be used.

Start the engine



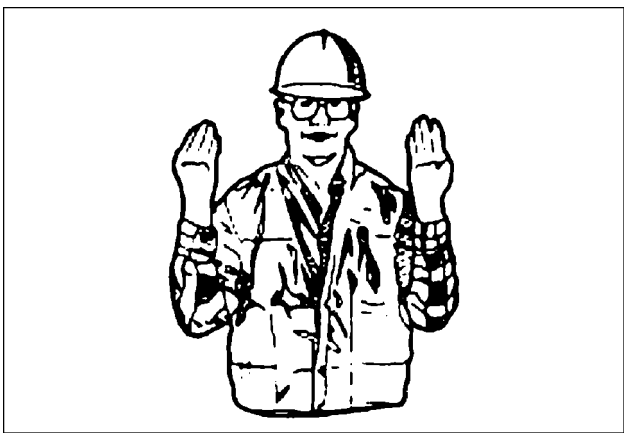
RCPH10WHL017BAD 1

Stop the engine



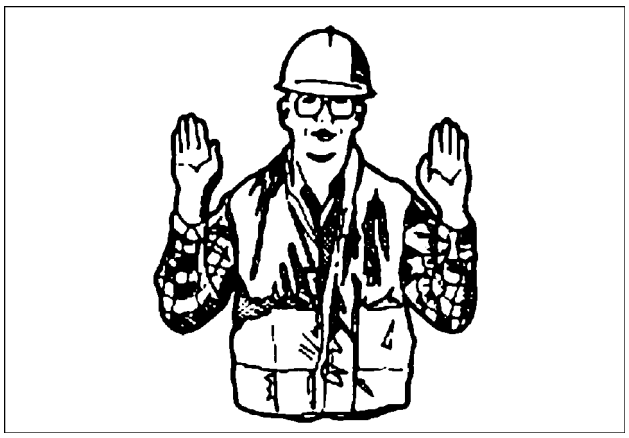
RCPH10WHL005BAD 2

Come to me
Wave hands back and forth (palms inward).



RCPH10WHL018BAD 3

Move away from me
Wave hands back and forth (palms outward).

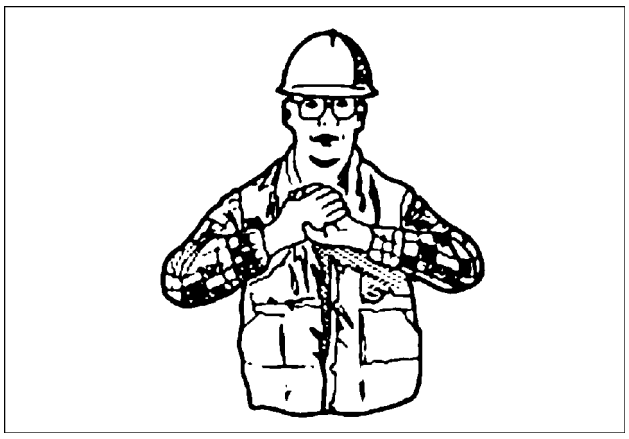


RCPH10WHL019BAD 4

Go this far

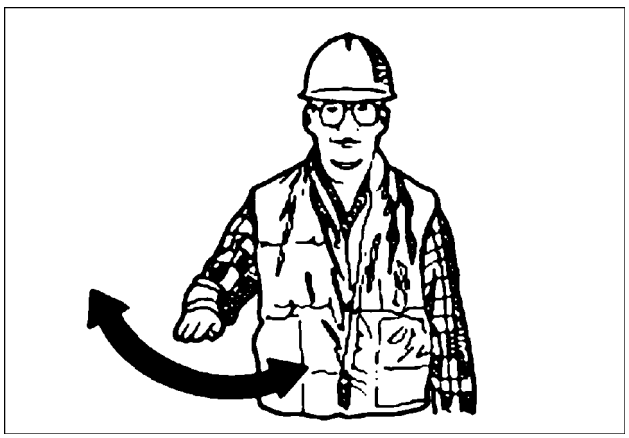
RCPH10WHL020BAD 5

All stop and hold



RCPH10WHL002BAD 6

Stop
Move one hand back and forth.

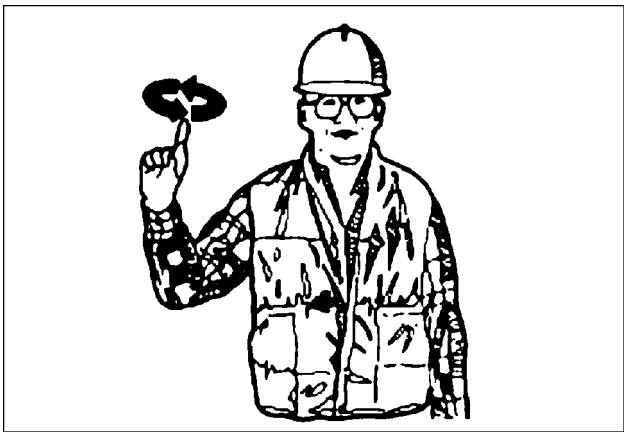


RCPH10WHL009BAD 7

Emergency stop
Move both hands back and forth.

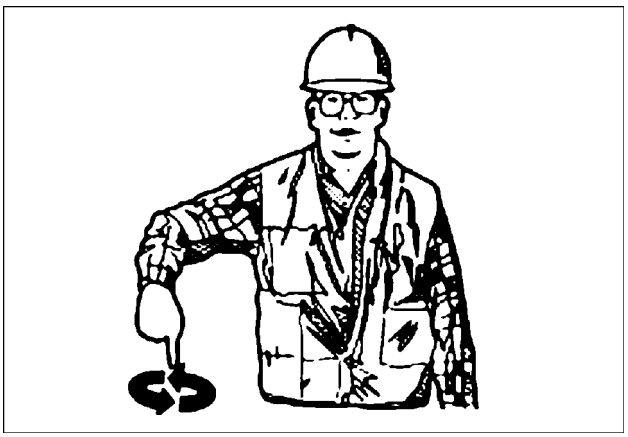
RCPH10WHL004BAD 8

Raise load or tool



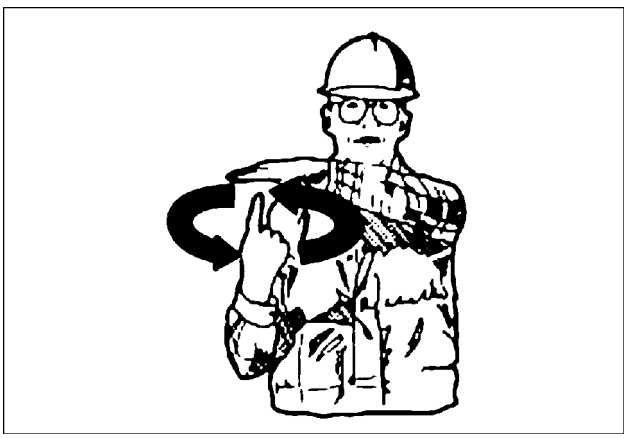
RCPH10WHL008BAD 9

Lower load or tool



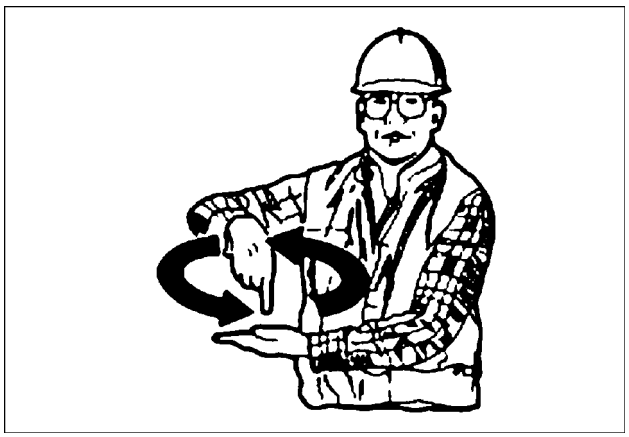
RCPH10WHL007BAD 10

Raise load or tool slowly



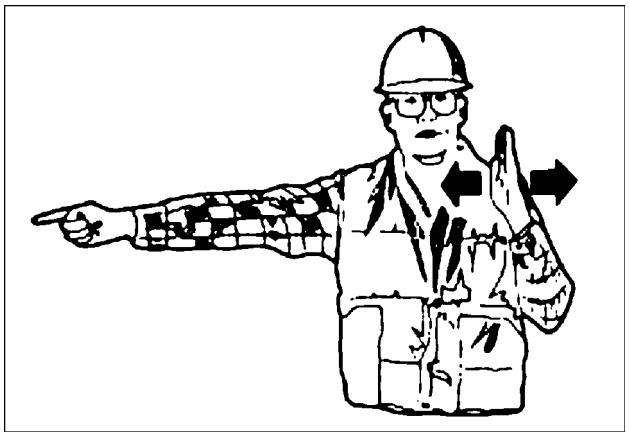
RCPH10WHL001BAD 11

Lower load or tool slowly



RCPH10WHL006BAD 12

Turn machine left swing load left
To stop movement, stop moving hand and make a fist.

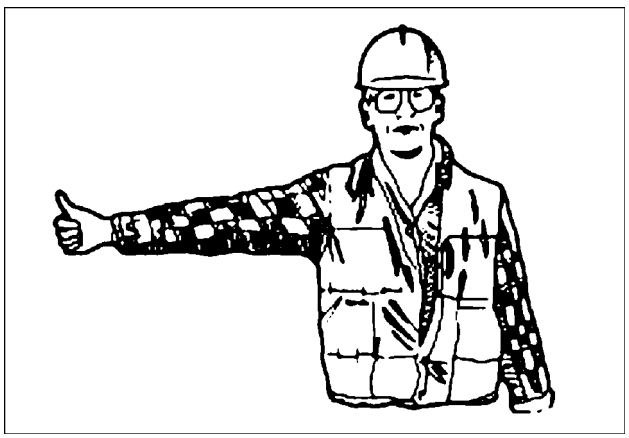


RCPH10WHL013BAD 13

Turn machine right swing load right
To stop movement, stop moving hand and make a fist

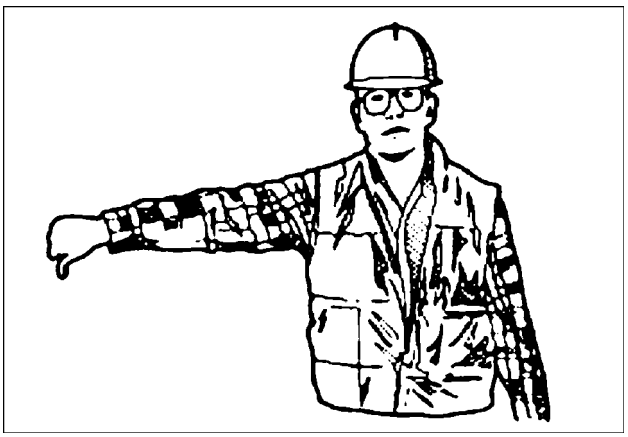
RCPH10WHL012BAD 14

Raise boom



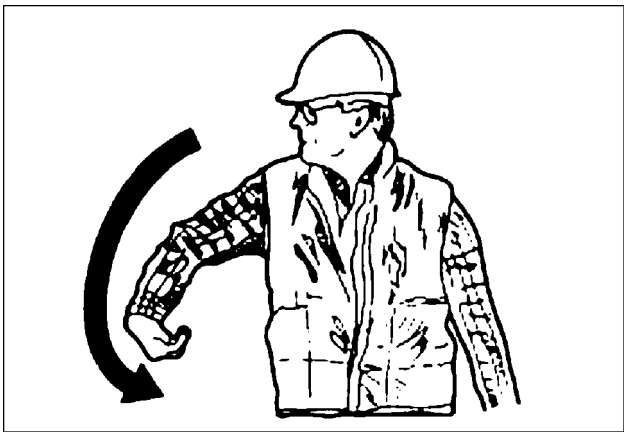
RCPH10WHL021BAD 15

Lower the boom



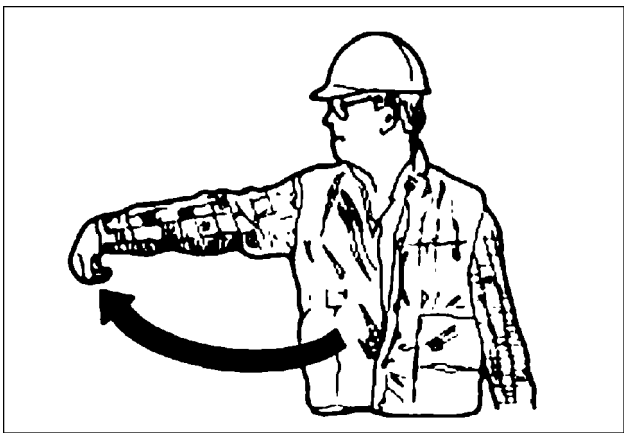
RCPH10WHL016BAD 16

Retract arm



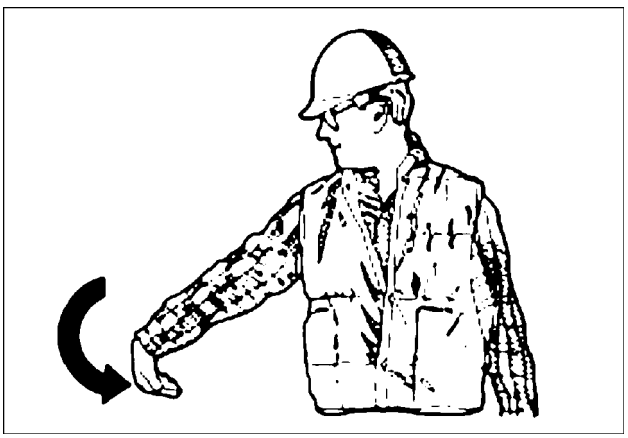
RCPH10WHL014BAD 17

Extend arm



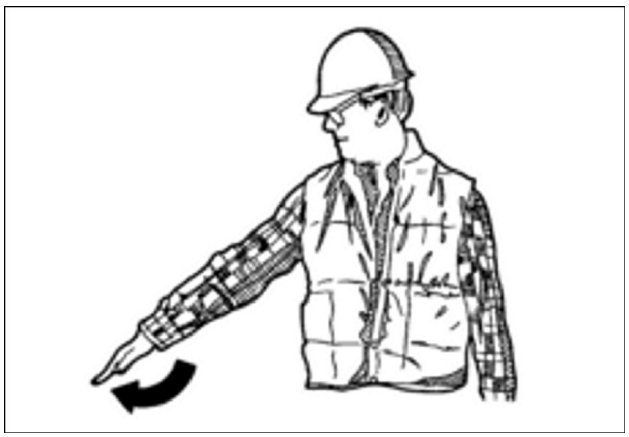
RCPH10WHL011BAD 18

Fill tool



RCPH10WHL015BAD 19

Empty tool



RCPH10WHL010BAD 20

Safety signs

Safety decals

⚠ WARNING

Avoid injury!
Make sure decals are perfectly legible. Clean decals regularly. Replace all damaged, missing, painted over, or illegible decals. See your dealer for replacement decals. When replacing parts bearing decals, be sure to put new decals on each new part.
Failure to comply could result in death or serious injury.

W0229A

The following safety signs are placed on your machine as a guide for your safety and for those working with you. Walk around the machine and note the content and location of these safety signs before operating your machine.
Keep safety signs clean and legible. Clean safety signs with a soft cloth, water, and a gentle detergent. Do not use solvent, gasoline, or other harsh chemicals. Solvents, gasoline, and other harsh chemicals may damage or remove safety signs.
Replace all safety signs that are damaged, missing, painted over, or illegible. If a safety sign is on a part that is replaced, make sure the safety sign is installed on the new part. See your dealer for replacement safety signs.

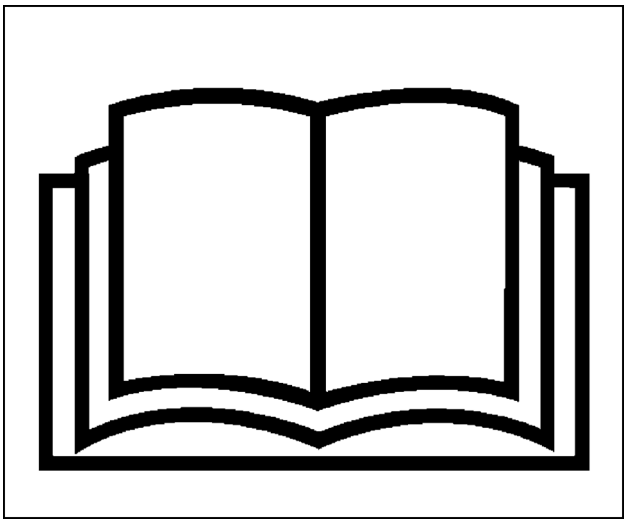
Make sure that you read all the safety decals and all instructional decals. The decals are intended for the personal safety of you and those working with you. Review the decals with all machine operators.

NOTE: *some decal locations may vary slightly between various model configurations.*

NOTE: *when you clean the decals, use only a cloth, water and soap. Do not use solvents, gasoline, etc.*

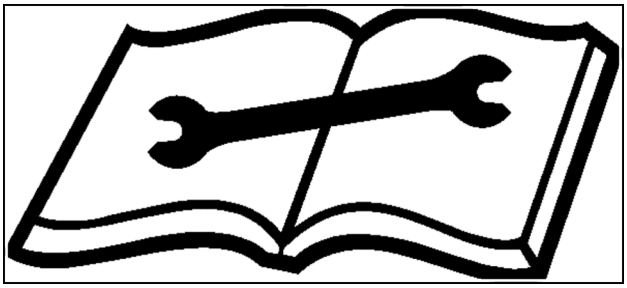
NOTE: *this chapter only covers decals relating to safety and machine operation and servicing. For information on all decals for the machine, consult your authorized dealer.*

This symbol instructs you to refer to the Operator's Manual for further information regarding maintenance, operational guidelines, etc.



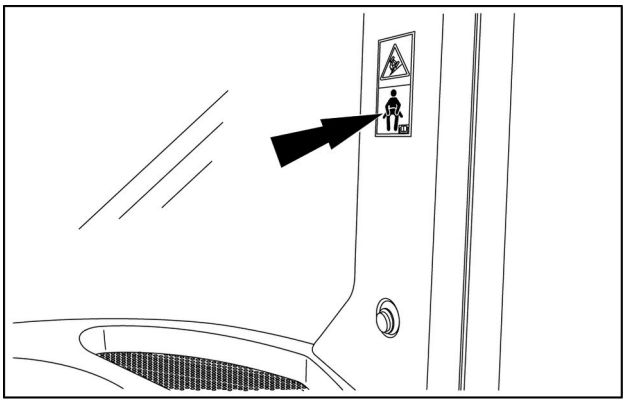
RCIL10WHL168BAL 1

This symbol instructs you to refer to the Service Manual. If you doubt your ability to perform any service operation, contact your authorized dealer.



RCIL10WHL169BAL 2

Use Seat Belt

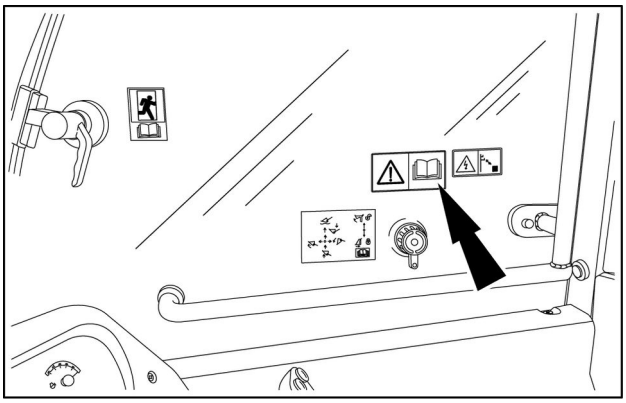


LEIL14CWL0026AA 3

This safety decal is located on the support inside the operator’s compartment.
WARNING: avoid crushing. Do not jump if machine tips. Use seat belt. Failure to comply with this warning could result in death or serious injury.
North American decal number: 386241A1
French Canadian decal number: 386241A1
Spanish decal number: 386241A1

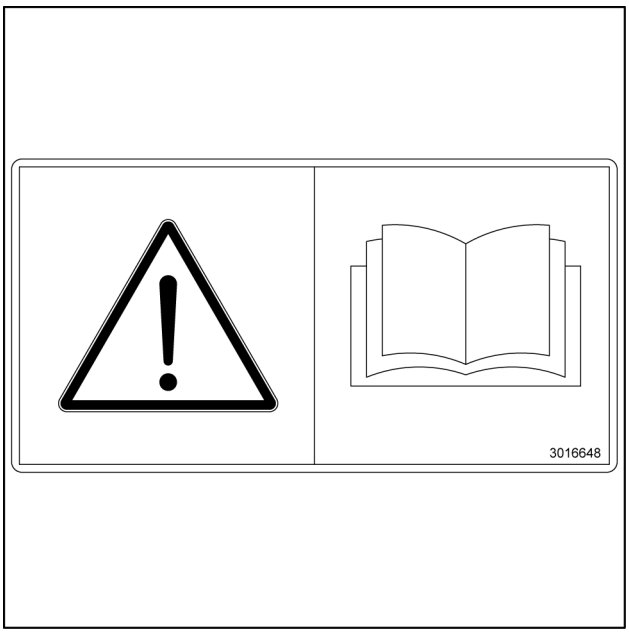
386241A1 4

Read Operator's Manual



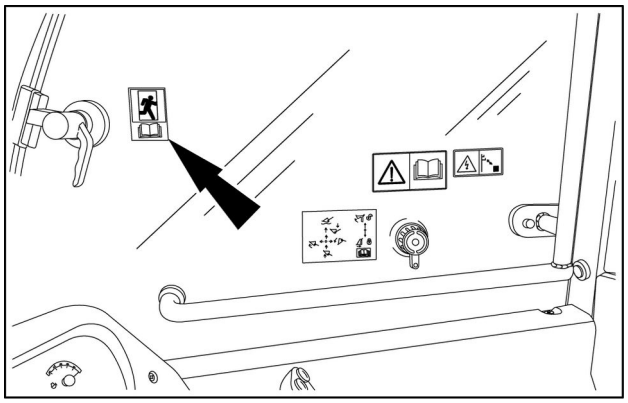
LEIL14CWL0027AA 5

This safety decal is located inside the operator's compartment.
WARNING: read the Operator's Manual. Fasten seat belt. No riders. Keep others away. Failure to comply with this warning could result in death or serious injury.
North American decal number: 3016648
French Canadian decal number: 3016648
Spanish decal number: 3016648



3016648 6

Emergency exit

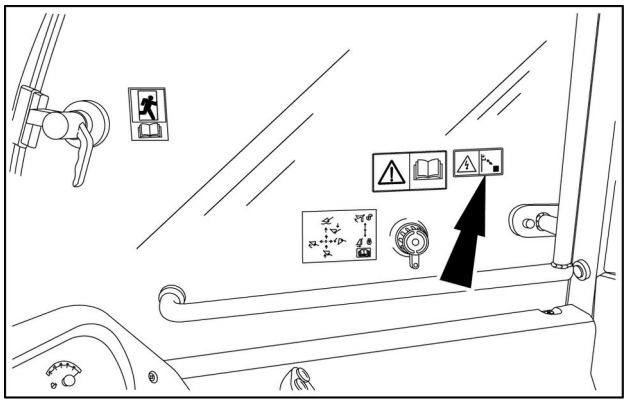


LEIL14CWL0027AA 7

This safety decal is located on the right operator's compartment window. It indicates the window is the emergency exit.
North American decal number: 329051A1
French Canadian decal number: 329051A1
Spanish decal number: 329051A1

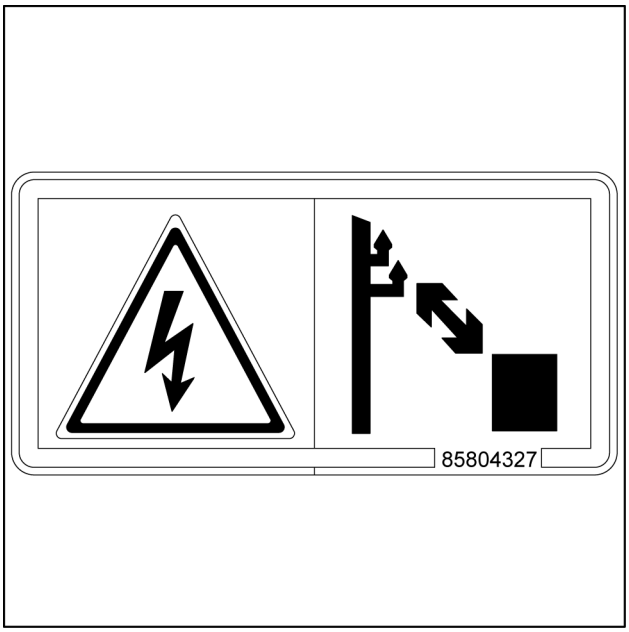
329051A1 8

Electricity danger



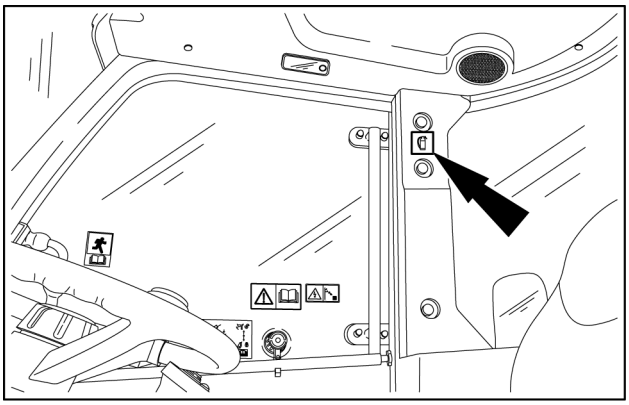
LEIL14CWL0027AA 9

This safety decal is located on the right operator's compartment window.
DANGER: electricity danger. Make sure the attachment used is at a minimum distance of **8.0 m** (**26.2 ft**) from the near electric power lines and poles.
Failure to comply with this warning could result in death or serious injury.
North American decal number: 85804327
French Canadian decal number: 85804327
Spanish decal number: 85804327



85804327 10

Fire extinguisher

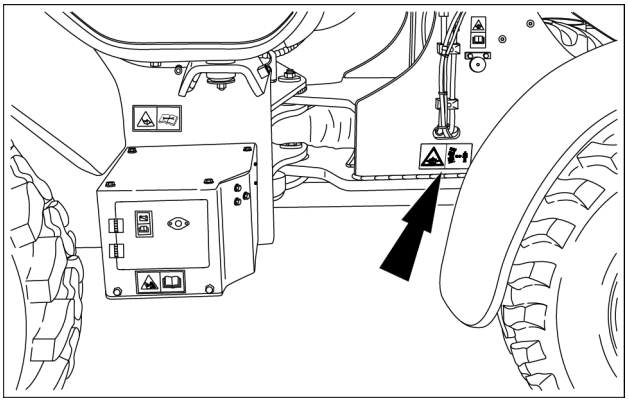


LEIL14CWL0031AB 11

This safety decal is located on the support inside the operator's compartment. Where fitted, ensure the fire extinguisher complies with the local regulations and is fully serviceable.
North American decal number: 85804337
French Canadian decal number: 85804337
Spanish decal number: 85804337

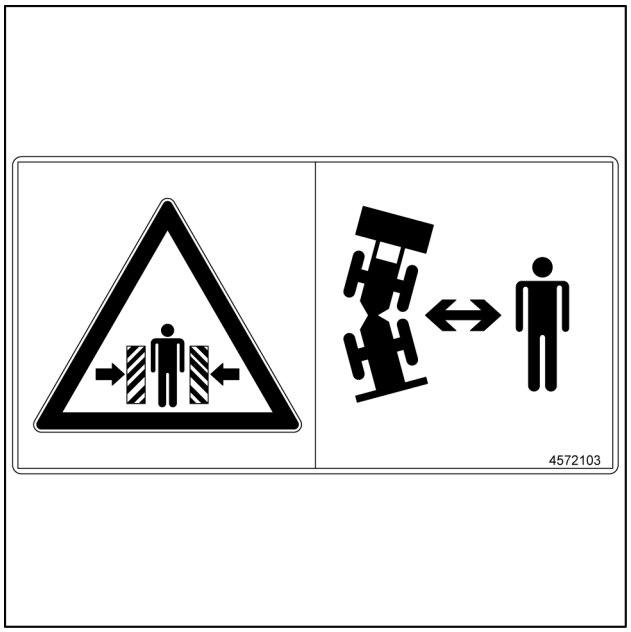
85804337 12

Crush Hazard



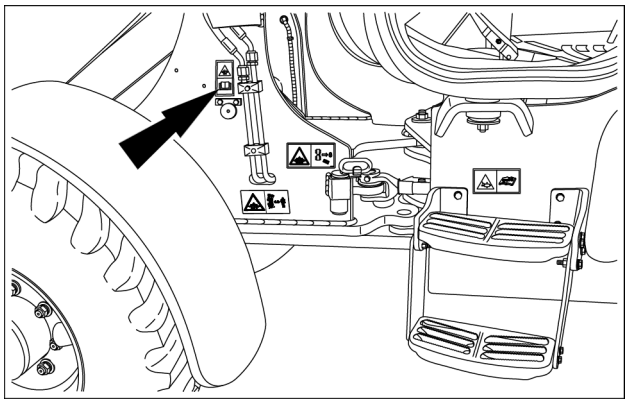
LEIL14CWL0635AA 13

This safety decal is located on the right-hand and left-hand side of the machine articulation area.
WARNING: crush hazard. Keep clear. Failure to comply with this warning could result in death or serious injury.
North American decal number: 4572103
French Canadian decal number: 4572103
Spanish decal number: 4572103



4572103 14

Pressurized system hazard

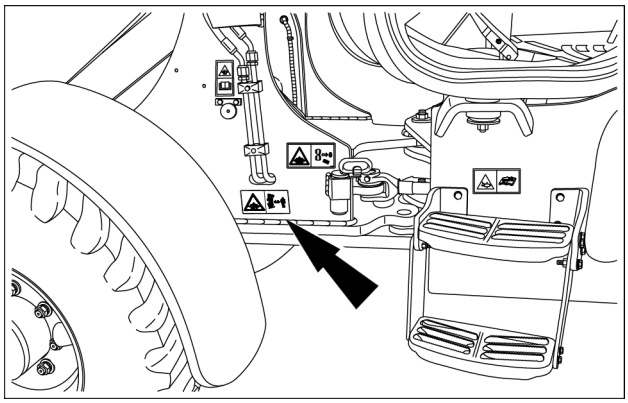


LEIL14CWL0634AA 15

This safety decal is located on the left-hand side of the machine near the tubes under the work lights.
WARNING: pressurized system hazard. Relieve pressure before maintenance. Failure to comply with this warning could result in death or serious injury.
North American decal number: 4575183
French Canadian decal number: 336010A1
Spanish decal number: 336011A1

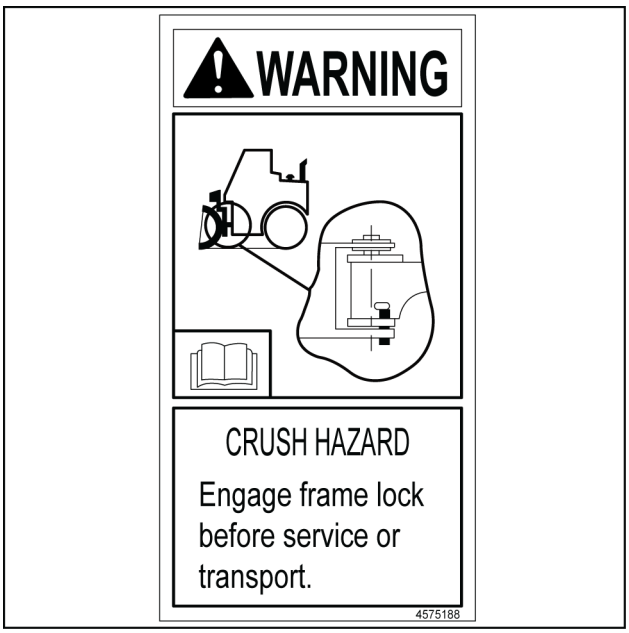
4575183 16

Crush Hazard – Articulation lock



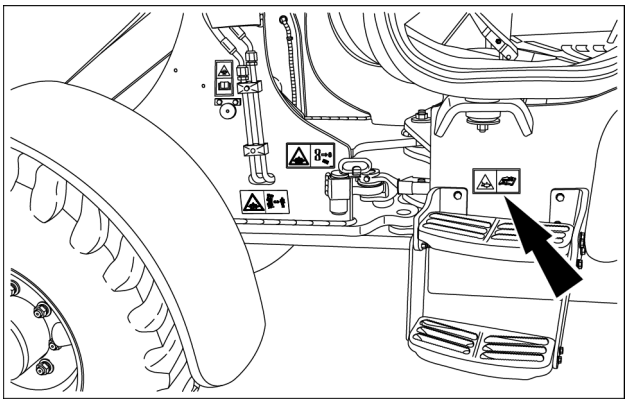
LEIL14CWL0634AA 17

This safety decal is located on the left-hand side of the machine.
WARNING: crush hazard. Engage lock pin before service or transport. Failure to comply with this warning could result in death or serious injury.
North American decal number: 4575188
French decal number: 354574A1
Spanish decal number: 354573A1



4575188 18

Pressured system hazard

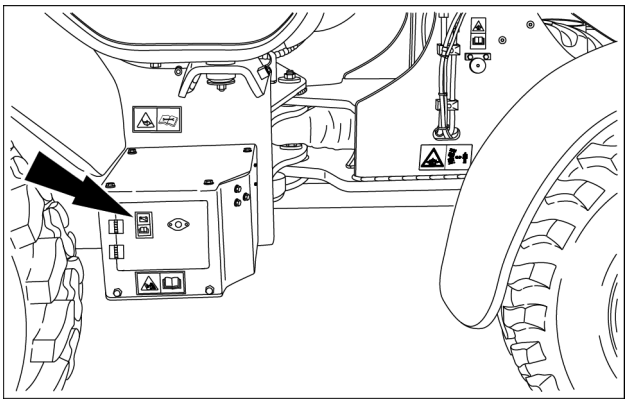


LEIL14CWL0634AA 19

This safety decal is located on the left-hand and right-hand side of the machine under the operator's compartment.
WARNING: pressured system hazard. Release all pressure before working systems which have an accumulator.
Failure to comply with this warning could result in death or serious injury.
North American decal number: 4575189
French Canadian decal number: 334012A1
Spanish decal number: 334015A1

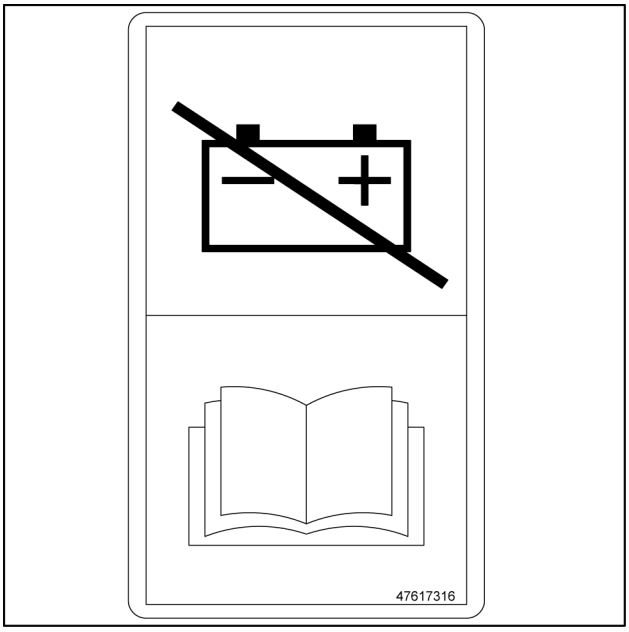
4575189 20

Battery main switch



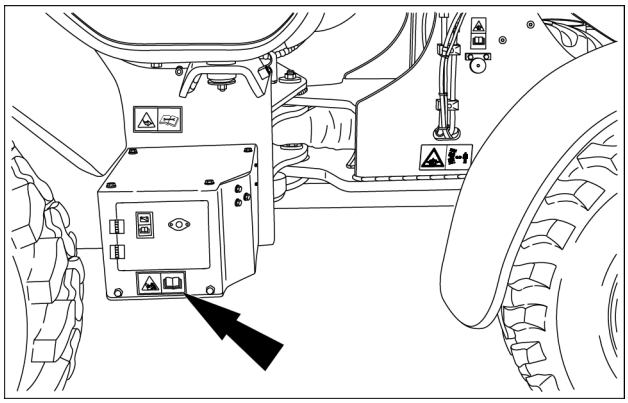
LEIL14CWL0635AA 21

This safety decal is located on the right-hand side of the machine, on the battery outer panel. It indicates the location of the battery main switch, which is to be used to turn OFF and ON the battery.
North American decal number: 47617316
French Canadian decal number: 47617316
Spanish decal number: 47617316



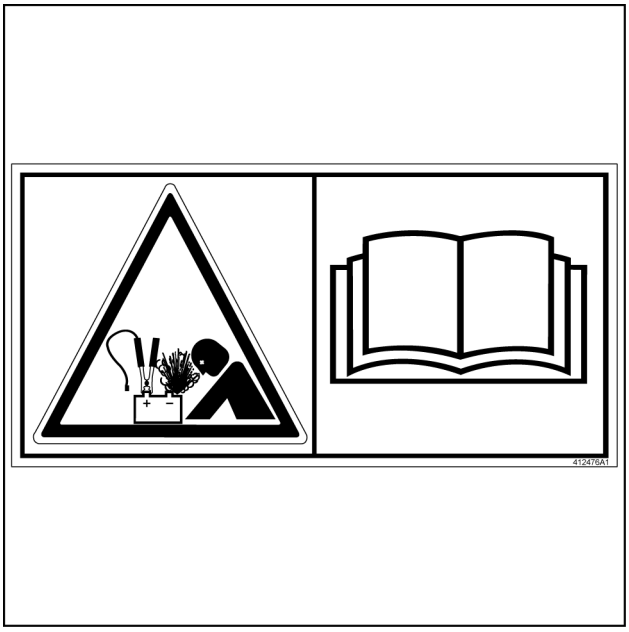
47617316 22

Explosion Hazard



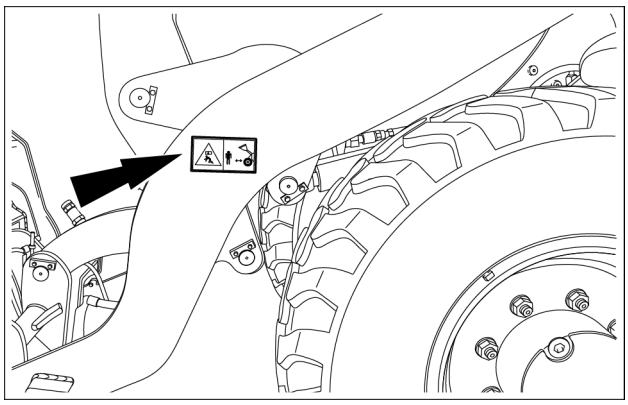
LEIL14CWL0635AA 23

This safety decal is located on the right-hand side of the machine, on the battery compartment.
DANGER: explosion hazard. Read procedure in the Operator's Manual before jump start or service to avoid injury. Failure to comply with this warning could result in death or serious injury.
North American decal number: 412476A1
French Canadian decal number: 412476A1
Spanish decal number: 412476A1



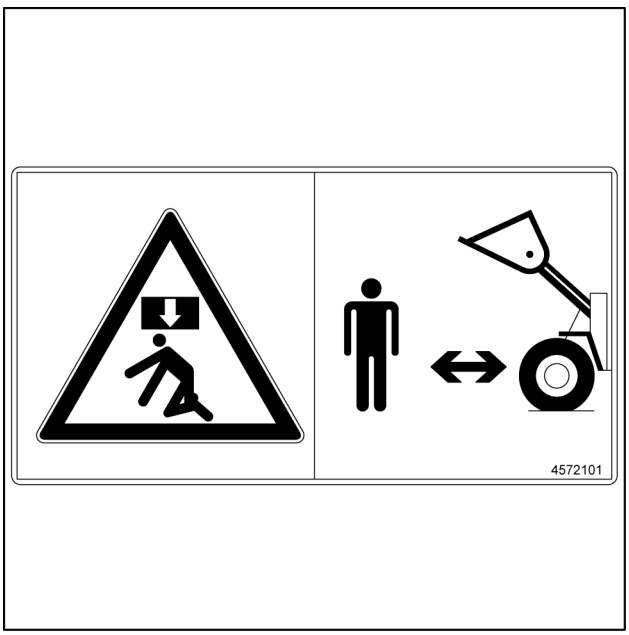
412476A1 24

Frontal stay hazard



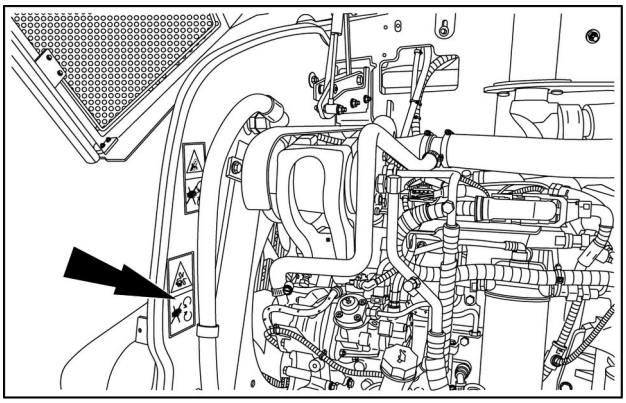
LEIL15CWL0138AB 25

This safety sign is located on the left-hand and right-hand side of the machine on the lifting arm.
WARNING: frontal stay hazard. Do not stay in front of the machine during working operations. Failure to comply with this warning could result in death or serious injury.
North American decal number: 4572101
French Canadian decal number: 4572101
Spanish decal number: 4572101



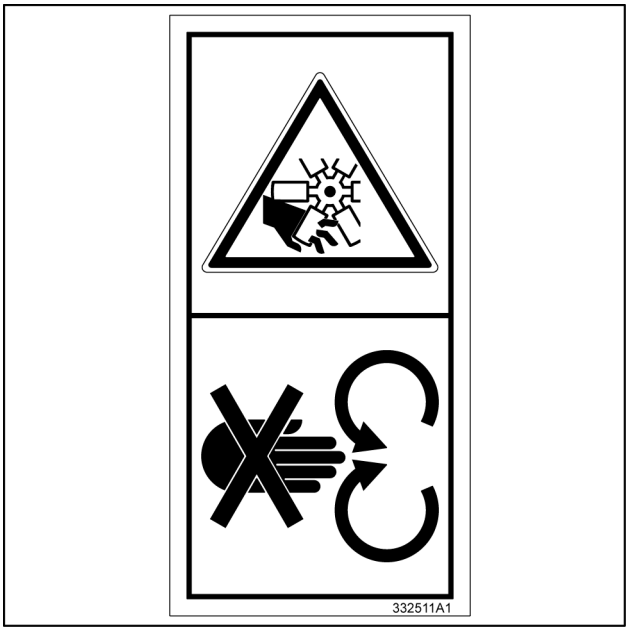
4572101 26

Entanglement hazard



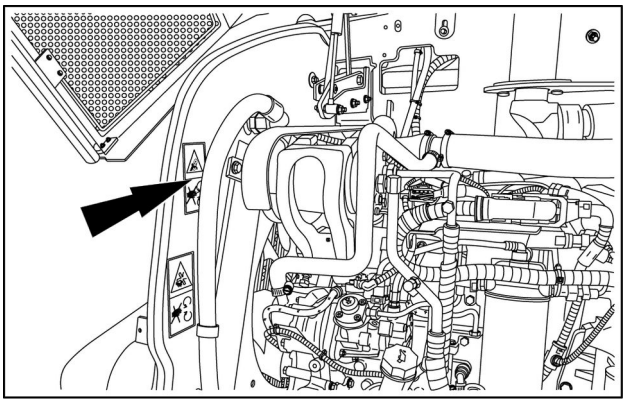
LEIL14CWL0032AA 27

This safety decal is located on the left-hand side of the machine, near the fan shroud.
WARNING: entanglement hazard. Keep clear or stop engine before servicing. Failure to comply with this warning could result in death or serious injury.
North American decal number: 332511A1
French Canadian decal number: 332511A1
Spanish decal number: 332511A1



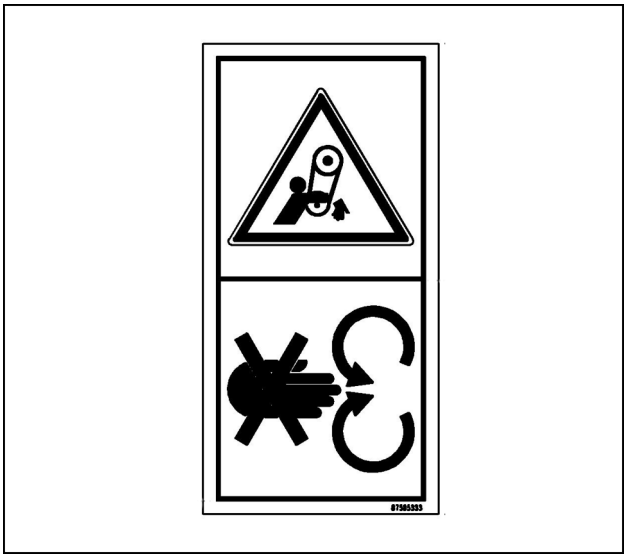
332511A1 28

Drive belt entanglement hazard



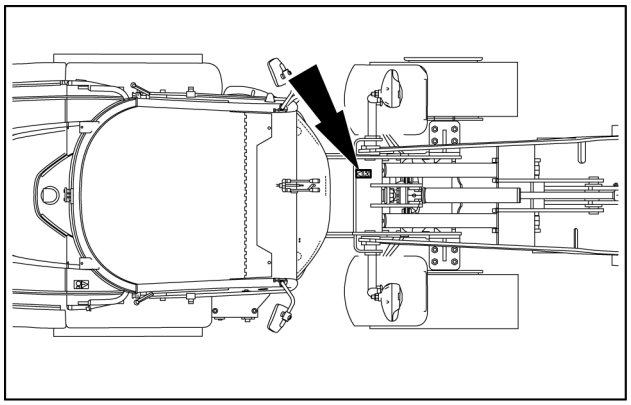
LEIL14CWL0032AA 29

This safety decal is located on the left-hand side of the machine, near the fan shroud and the drive belt.
WARNING: entanglement hazard. Keep clear or stop engine before servicing. Failure to comply with this warning could result in death or serious injury.
North American decal number: 87585333
French Canadian decal number: 87588333
Spanish decal number: 87585333



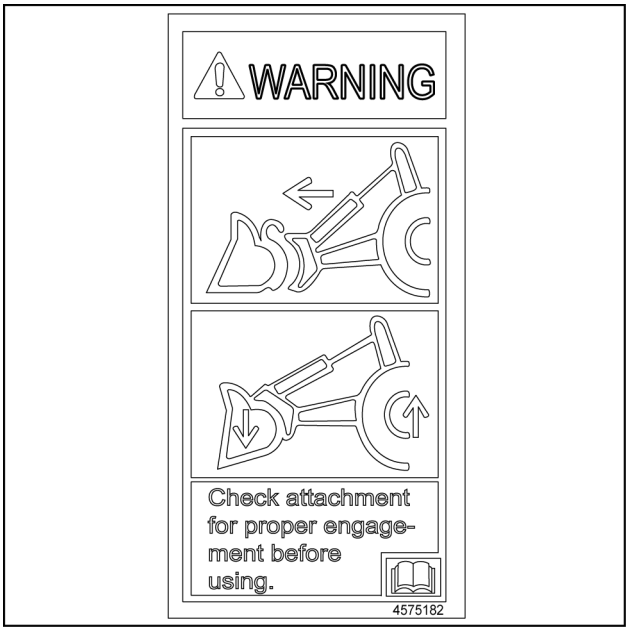
87585333 30

Falling heavy object hazard



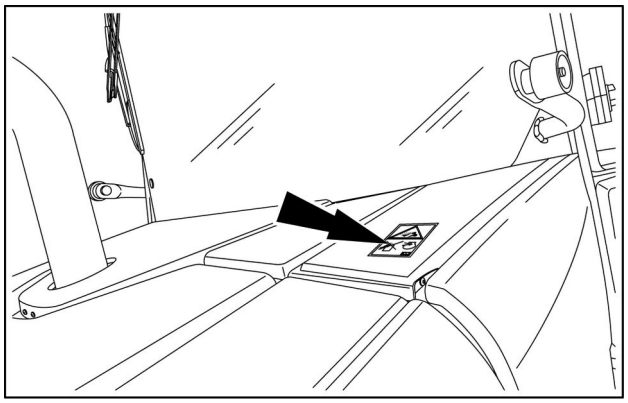
LEIL14CWL0035AB 31

This safety decal is located on the boom support, between the front work lights.
WARNING: falling heavy object hazard. Always check the attachment is securely locked. Failure to comply with this warning could result in death or serious injury.
North American decal number: 4575182
French Canadian decal number: 364919A1
Spanish decal number: 364918A1



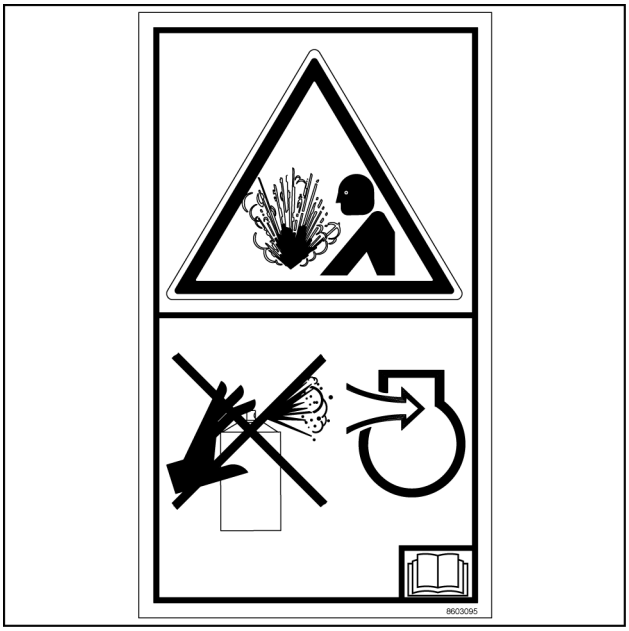
4575182 32

Explosion hazard – Do not use ether



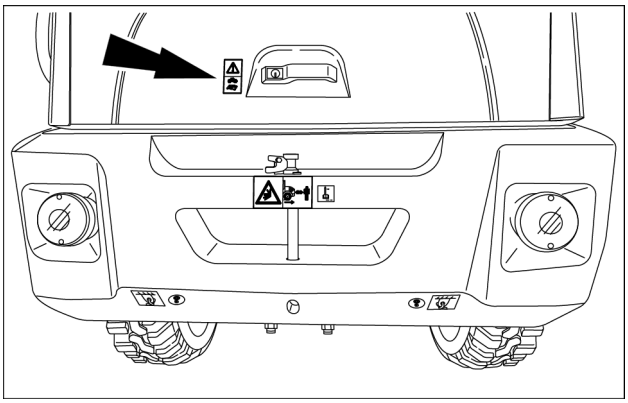
LEIL14CWL0036AA 33

This safety decal is located on the top of the hood machine, behind the operator's compartment.
WARNING: explosion hazard. Do not use ether. Failure to comply with this warning could result in death or serious injury.
North American decal number: 8603095
French Canadian decal number: 8603095
Spanish decal number: 8603095



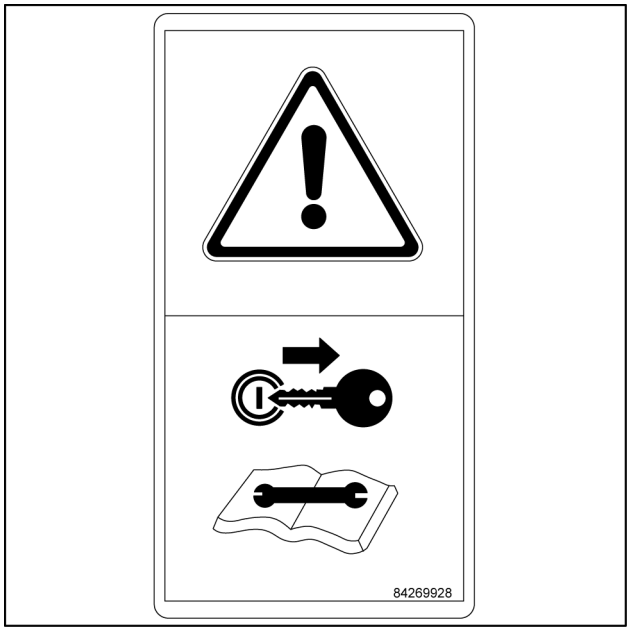
8603095 34

Opening of the engine hood



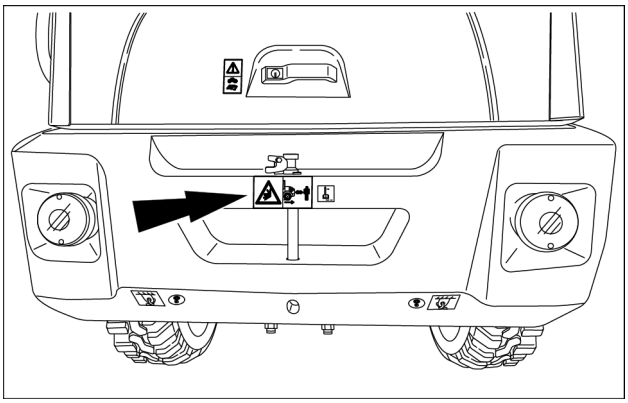
LEIL15CWL0104AA 35

This safety decal is located on the hood, at the rear of the machine.
WARNING: opening of the engine hood. Stop the engine and remove the ignition switch key. Use the ignition switch key to open the engine hood. Failure to comply with this warning could result in death or serious injury.
North American decal number: 84269928
French Canadian decal number: 86269928
Spanish decal number: 84269928



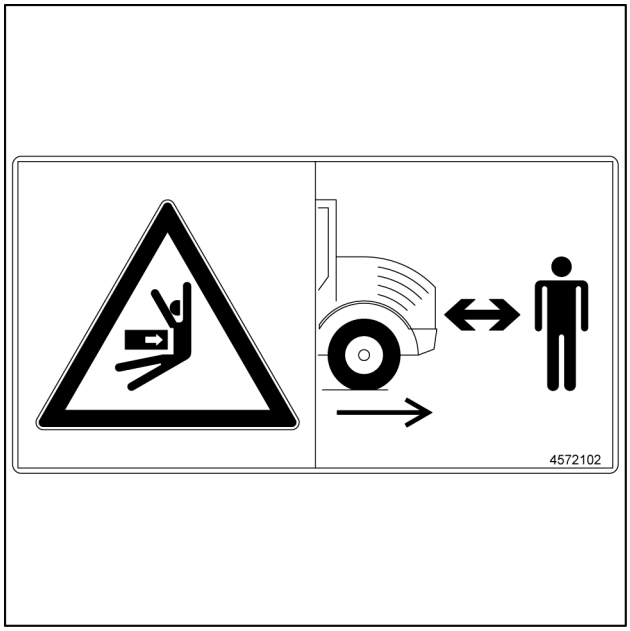
84269928 36

Rear stay hazard



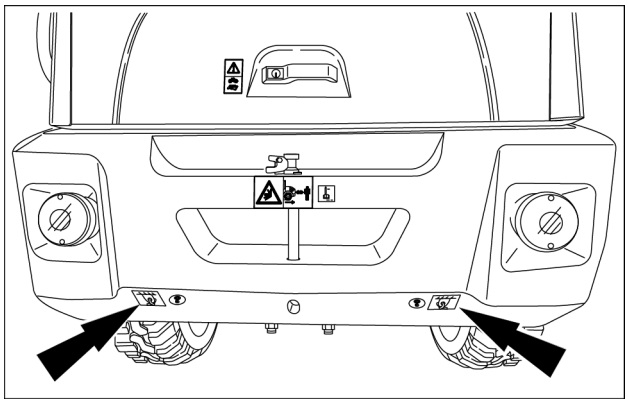
LEIL15CWL0104AA 37

This safety decal is located at the rear of machine.
WARNING: rear stay hazard. Nobody must stay behind the machine when the engine is running. Failure to comply with this warning could result in death or serious injury.
North American decal number: 4572102
French Canadian decal number: 4572102
Spanish decal number: 4572102

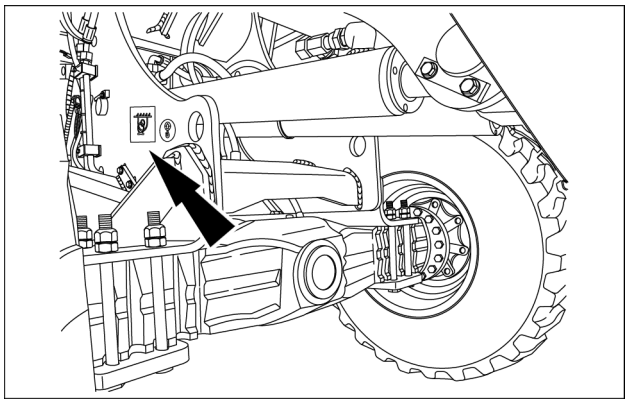


4572102 38

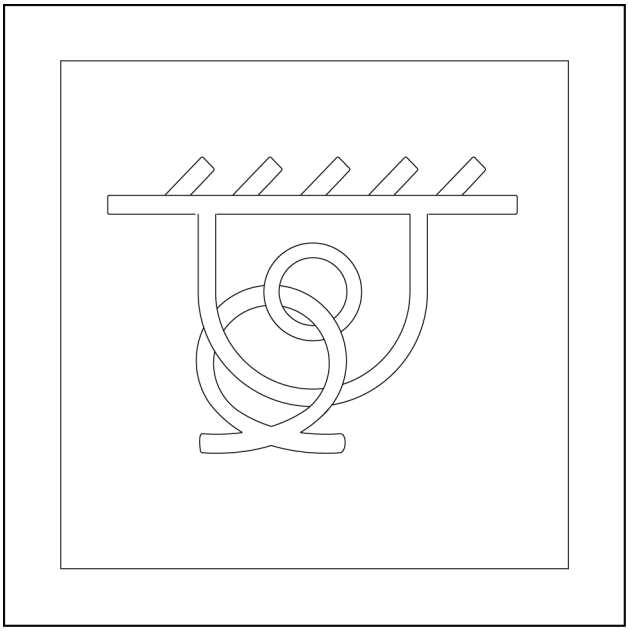
Tie down points



LEIL15CWL0104AA 39



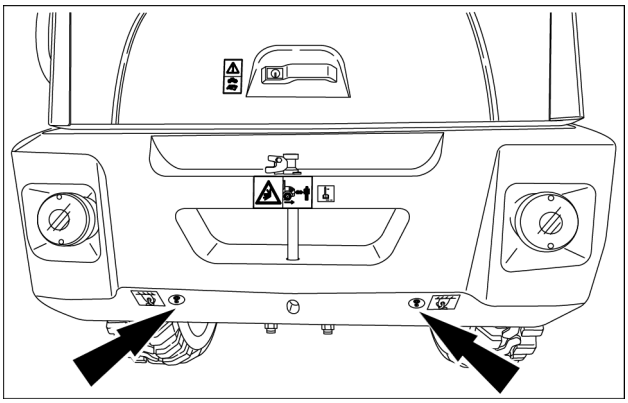
LEIL15CWL0103AA 40



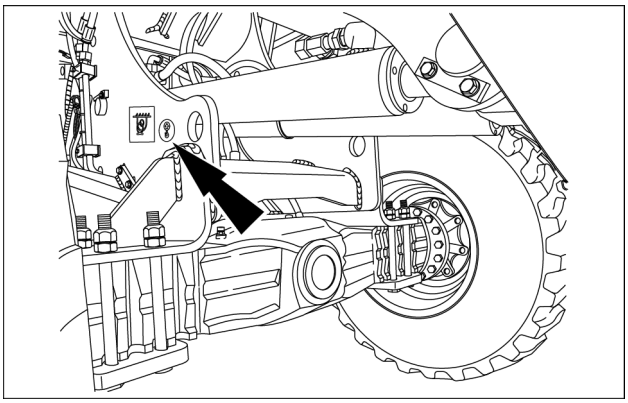
139728A1 41

These informational decals are located on the front and rear side of the machine. Tie down the machine only from the tie down points identified by this symbol.
North American decal number: 139728A1
French Canadian decal number: 139728A1
Spanish decal number: 139728A1

Lifting points



LEIL15CWL0104AA 42



LEIL15CWL0103AA 43

85804336 44

These informational decals are located on the front and rear side of the machine. Lift the machine only from the tie down points, as indicated by this decal.
North American decal number: 85804336
French Canadian decal number: 85804336
Spanish decal number: 85804336

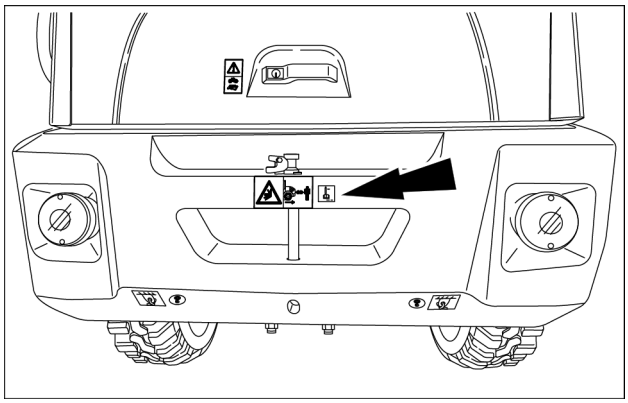
Decals symbol

⚠ WARNING

Avoid injury!
Make sure decals are perfectly legible. Clean decals regularly. Replace all damaged, missing, painted over, or illegible decals. See your dealer for replacement decals. When replacing parts bearing decals, be sure to put new decals on each new part.
Failure to comply could result in death or serious injury.

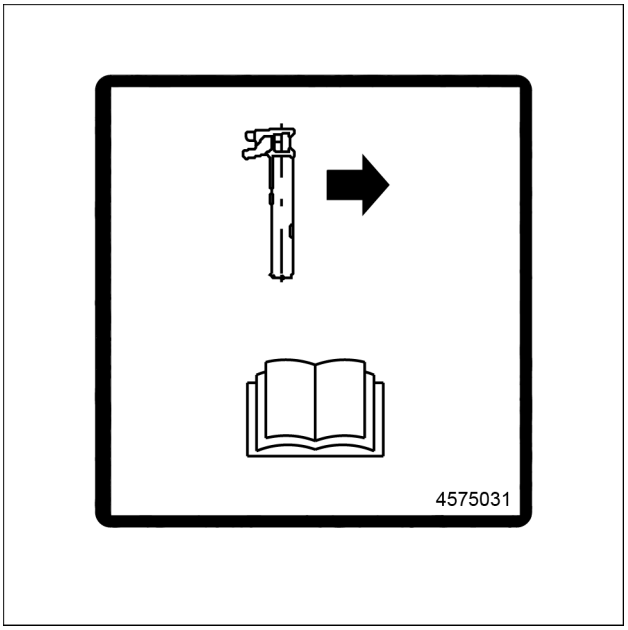
W0229A

Towing lug



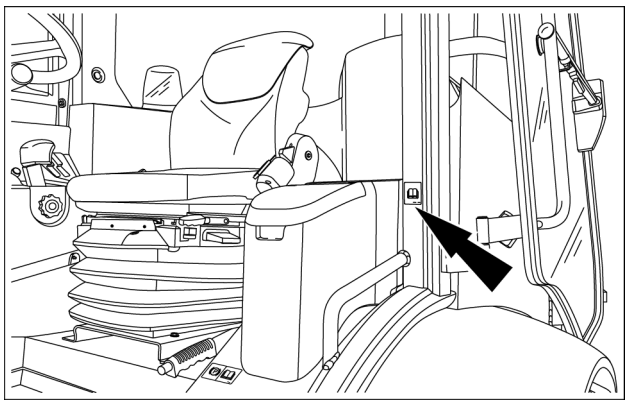
LEIL15CWL0104AA 45

This informational decal is located on the rear side of the machine. This decal indicates the location of the towing lug. See “Towing” – Chapter 5 in this manual for more information about the towing lug.
North American decal number: 4575031
French Canadian decal number: 4575031
Spanish decal number: 4575031



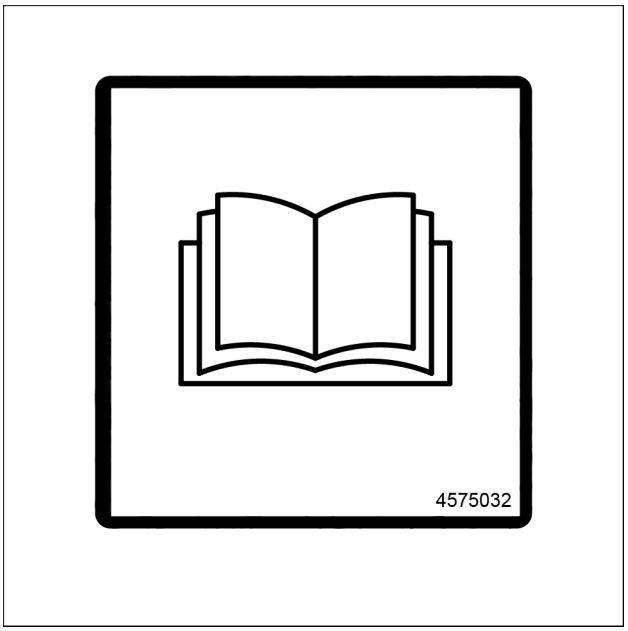
4575031 46

Operator’s Manual



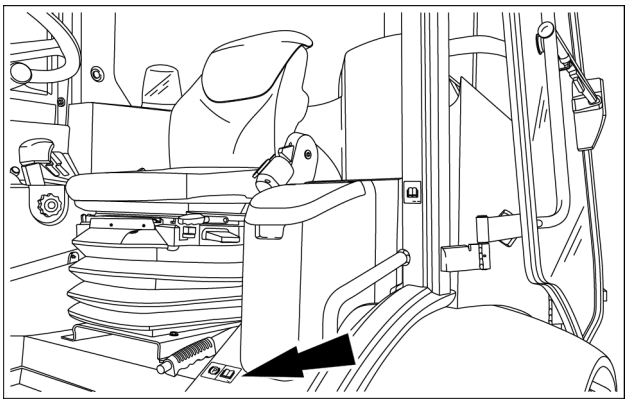
LEIL15CWL0098AA 47

This informational decal is located on the pillar in the cab, to the left-hand of the operator’s seat. See “Operator's Manual storage on the machine” – Chapter 1 in this manual for more information about the Operator’s Manual location.
North American decal number: 4575032
French Canadian decal number: 4575032
Spanish decal number: 4575032



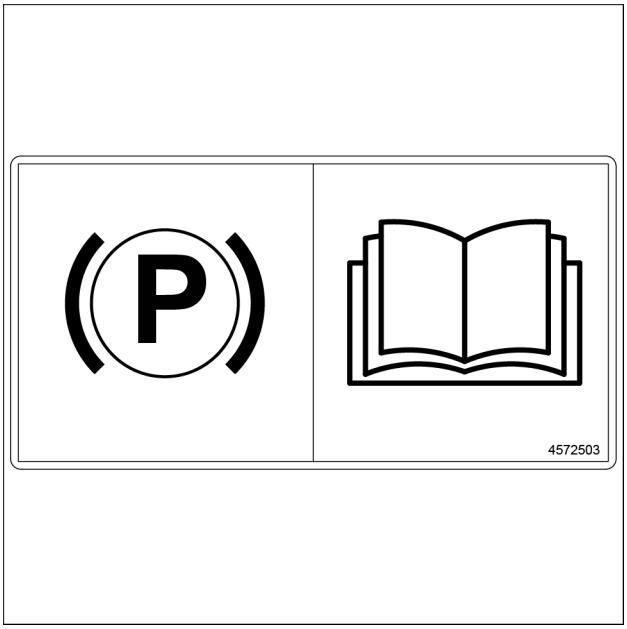
4575032 48

Parking brake



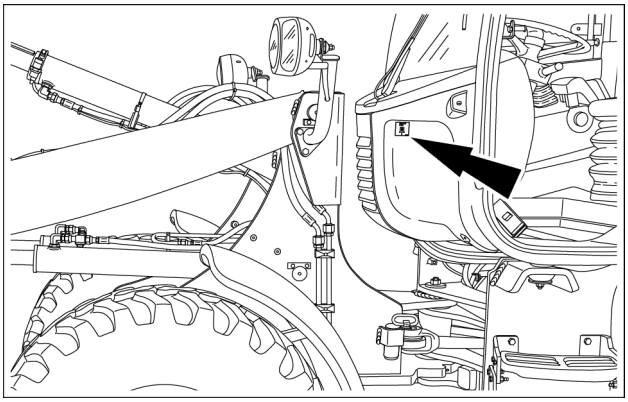
LEIL15CWL0098AA 49

This informational decal is located near the courtesy compartment on the left-hand side. This decal indicates the location of the parking brake. See “Parking brake” – Chapter 3 in this manual for more information.
North American decal number: 4572503
French Canadian decal number: 4572503
Spanish decal number: 4572503



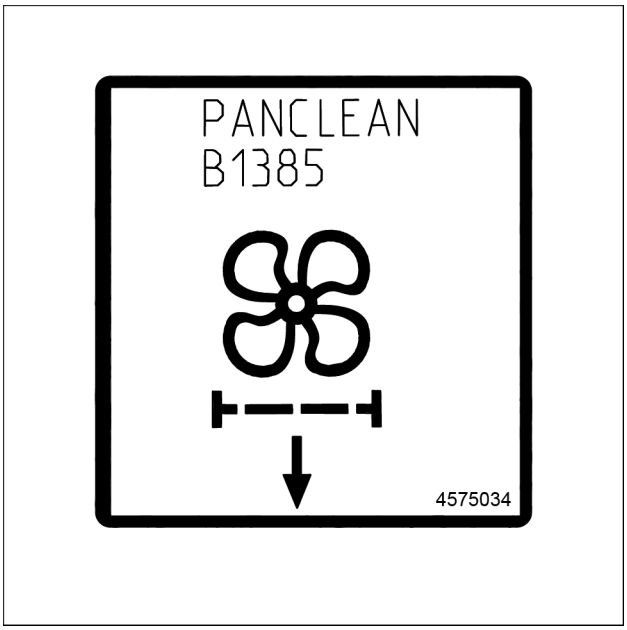
4572503 50

Cab air filter



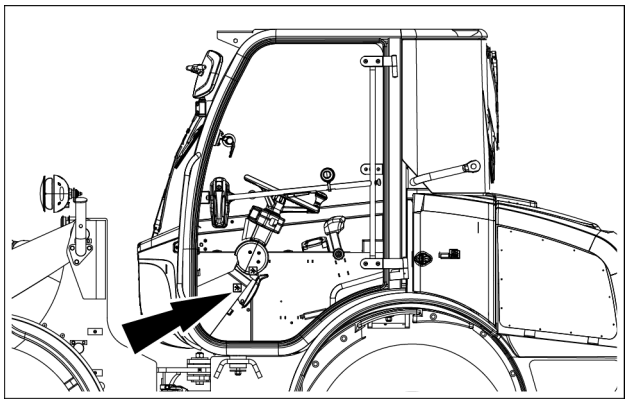
LEIL15CWL0132AA 51

This informational decal is located on the panel fastened to the front side of the external frame of the cab (left-hand side). This decal indicates the location of the cab air filter.
North American decal number: 4575034
French Canadian decal number: 4575034
Spanish decal number: 4575034



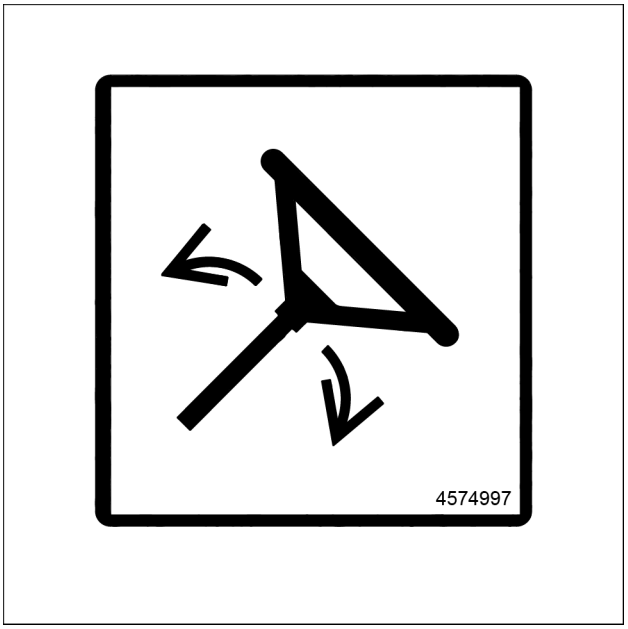
4575034 52

Adjustable steering column



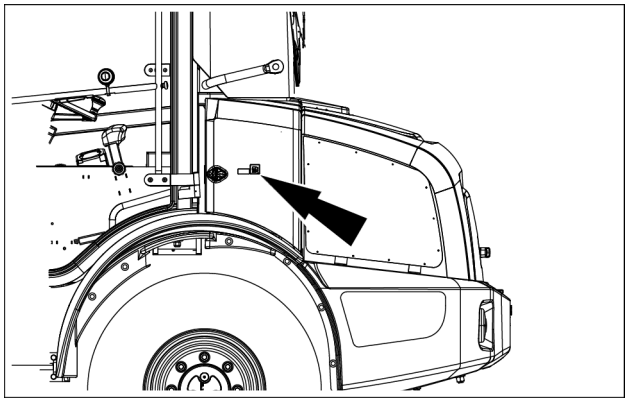
LEIL15CWL0133AB 53

This informational decal is located on the steering column, on the left-hand side. See “Steering column” – Chapter 3 in this manual for more information about the steering column adjustment.
North American decal number: 4574997
French Canadian decal number: 4574997
Spanish decal number: 4574997



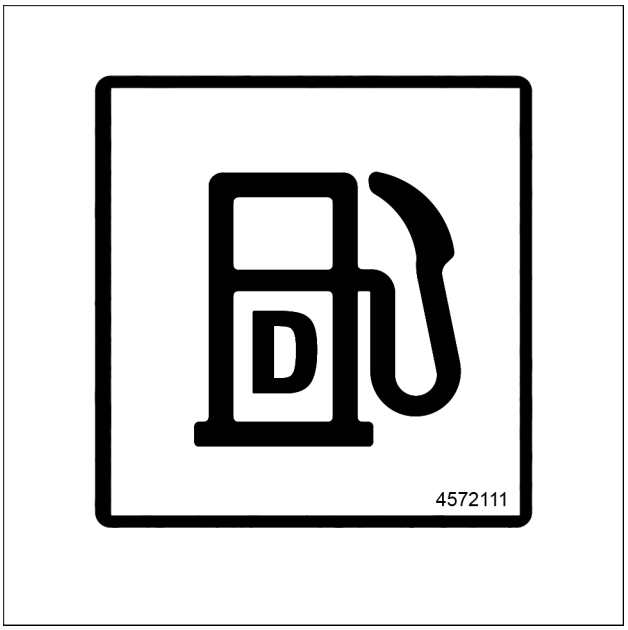
4574997 54

Fuel



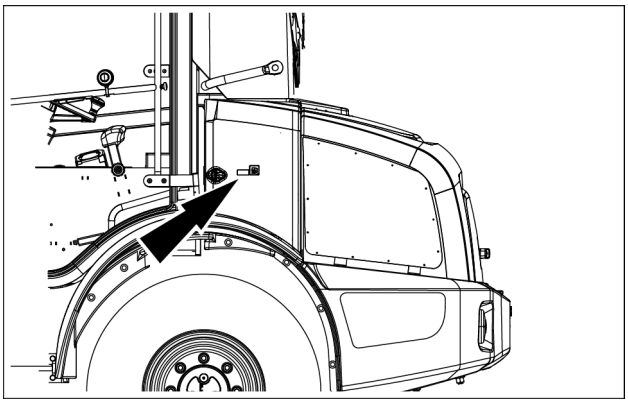
LEIL15CWL0131AA 55

This informational decal is located on the fuel tank access panel on the left-hand side of the machine. Do not place any substance other than diesel fuel in containers which have this symbol.
North American decal number: 4572111
French Canadian decal number: 4572111
Spanish decal number: 4572111



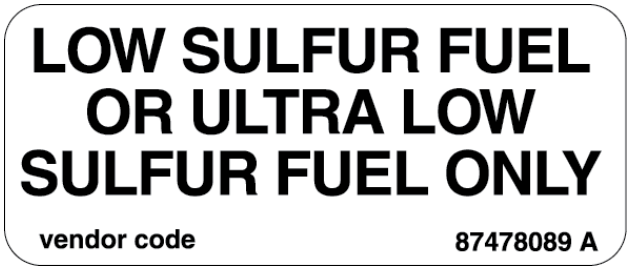
4572111 56

Low sulfur fuel



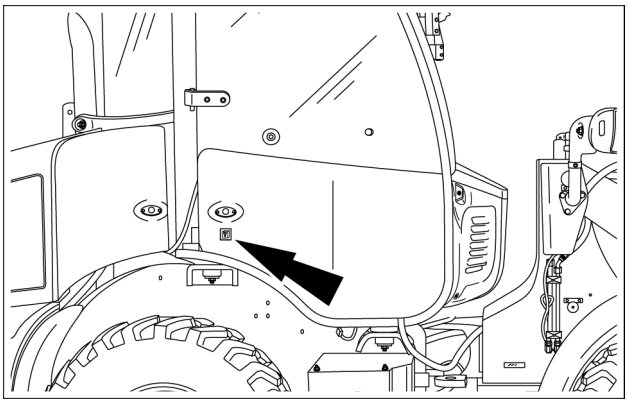
LEIL15CWL0131AA 57

This informational decal is located on the fuel tank access panel on the left-hand side of the machine. Use only low sulfur fuel or ultra low sulfur fuel on your machine.
North American decal number: 87478089
French Canadian decal number: 87478089
Spanish decal number: 87478089



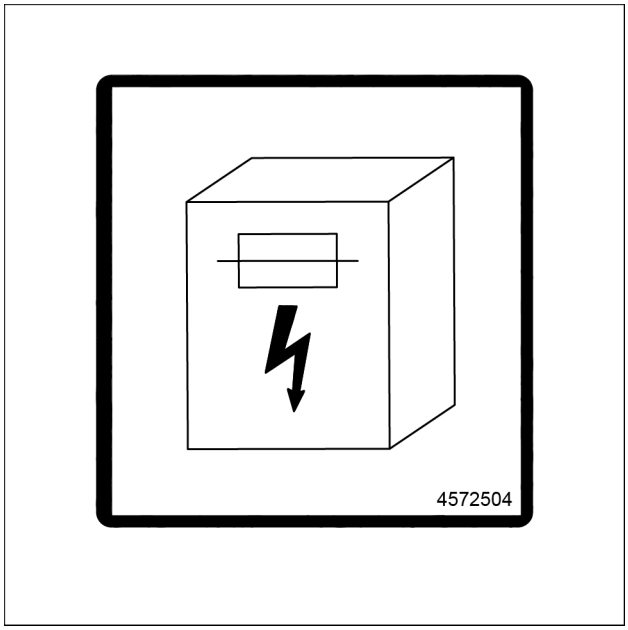
87478089_A 58

Fuse box



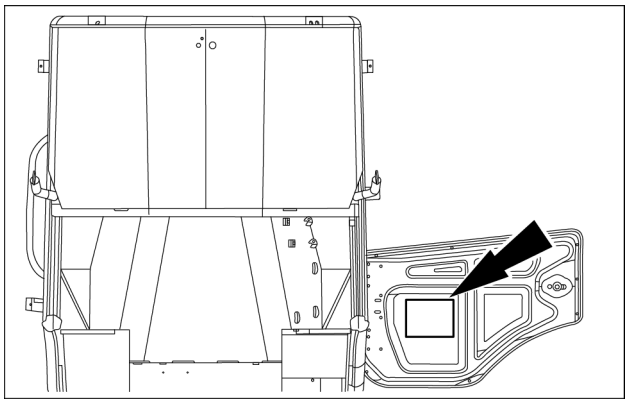
LEIL15CWL0134AB 59

This informational decal is located on the fuse and relay access door on the right-hand side of the machine. The decal indicates the location of the fuse and relay box. See “Fuses and relays” – Chapter 7 in this manual for more information.
North American decal number: 4572504
French Canadian decal number: 4572504
Spanish decal number: 4572504

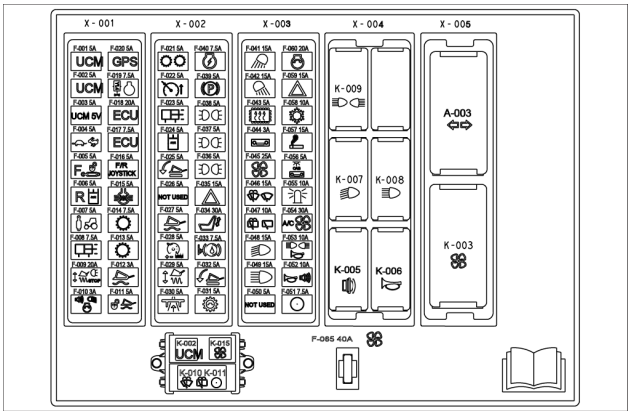


4572504 60

Fuse and relay



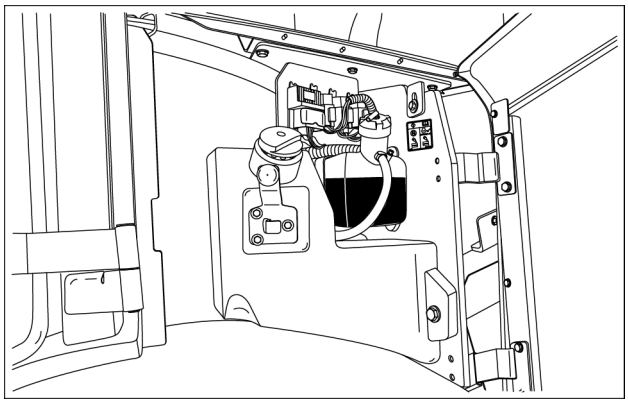
LEIL15CWL0135AB 61



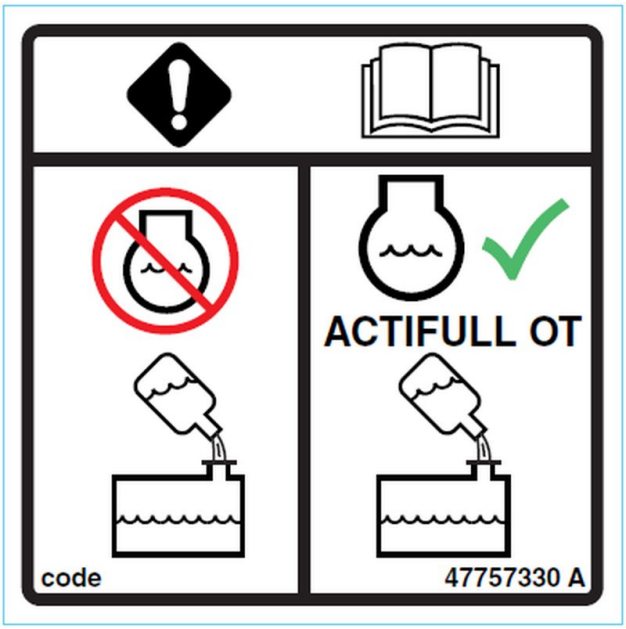
LEIL14CWL0632FA 62

This informational decal is located inside the fuse and relay access door on the right-hand side of the machine. See “Fuses and relays” – Chapter 7 in this manual for more information.
North American decal number: 47730079
French Canadian decal number: 47730079
Spanish decal number: 47730079

OAT coolant



LEIL15CWL0089AA 63



47757330 64

This informational decal is located in the fuel tank and coolant reservoir compartment. The decal indicates that the machine is equipped with the OAT coolant. Any other type of coolant is forbidden. See “Engine cooling system” – Chapter 7 in this manual for more information about the OAT coolant.
North American decal number: 47757330
French Canadian decal number: 47757330
Spanish decal number: 47757330

3 - CONTROLS AND INSTRUMENTS

Access to operator's platform

Proper entry and exit

⚠ WARNING

Fall hazard!
Clean the steps and access handles to remove all traces of grease, oil, mud, and ice (in winter).
Failure to comply could result in death or serious injury.

W0139A

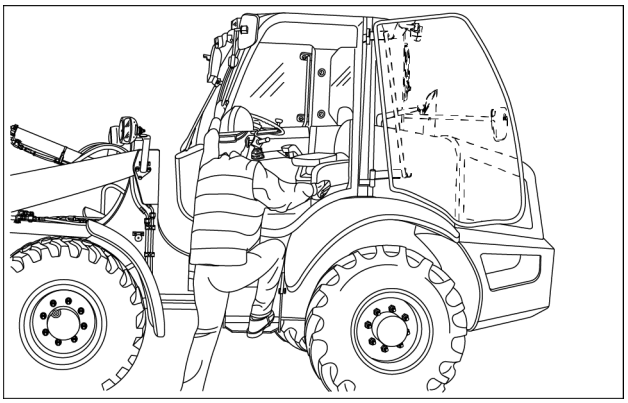
⚠ WARNING

Fall hazard!
Always lock the cab doors in the full open or full closed position before using the handrails on the doors.
Failure to comply could result in death or serious injury.

W0133A

Steps and hand holds

When getting down from or getting onto the machine, use the steps and hand holds. Use at least three points of support when getting on and off the machine. The cab door must be locked into the full open position before using the door hand hold.

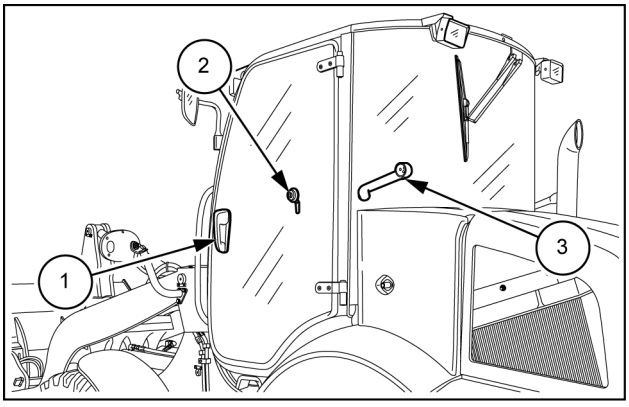


LEIL14CWL0041AA 1

Cab door

Use the key to lock or unlock door from outside of the cab.. Use the door handle **(1)** to open the door from the outside.

To lock in place, open the door completely until the catch **(2)** latches against the locking pin **(3)**.

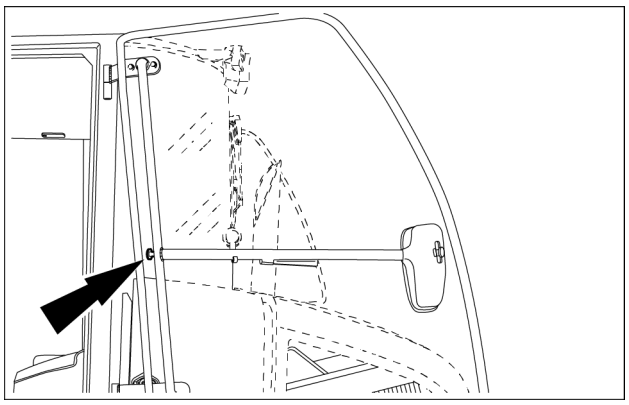


LEIL14CWL0042AB 2

To release the door from the full open position, pull on the door release which protrudes out of the handrail.

NOTICE: *the cab door must be locked into the full open position before using the door hand hold.*

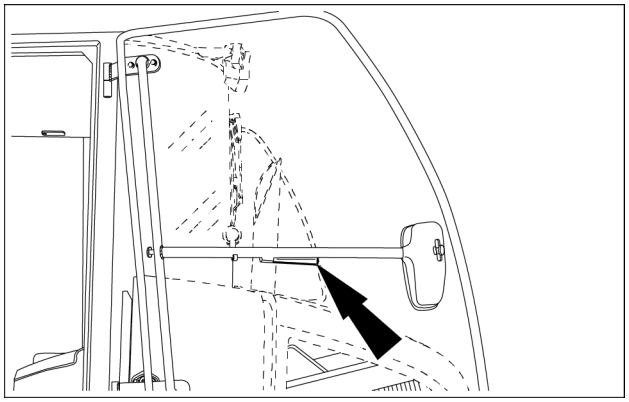
NOTE: *the key provided with the machine can be used to lock and unlock the various panels and to activate the engine starter switch functions.*



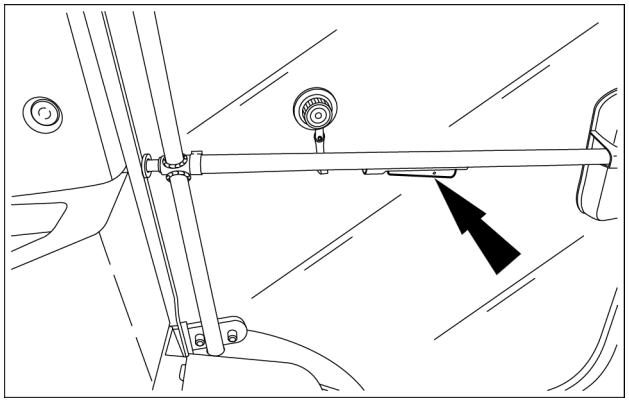
LEIL14CWL0048AB 3

Inside door latch

Push the latch to open the door from the inside.



LEIL14CWL0043AB 4



LEIL15CWL0077AA 5

Operator's seat

Overview

⚠ WARNING

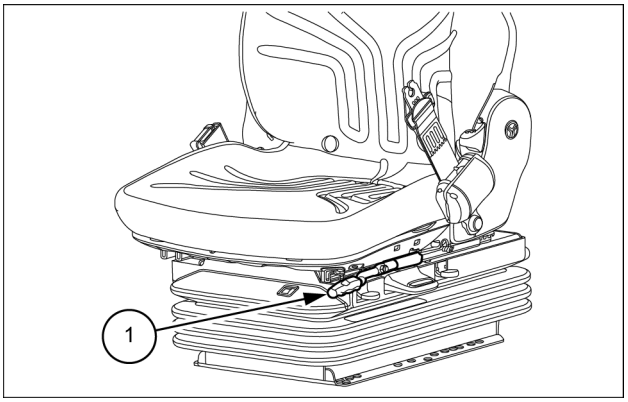
Loss of control hazard!
DO NOT make seat adjustments while the machine is in motion. All seat adjustment should be made with the machine stationary and the parking brake applied.
Failure to comply could result in death or serious injury.

W0293A

Air seat

Fore-and-aft adjustment

Pull the fore-and-aft adjustment lever **(1)** up and adjust the seat forward or backward as required. Release the lever **(1)** to lock the seat in position.

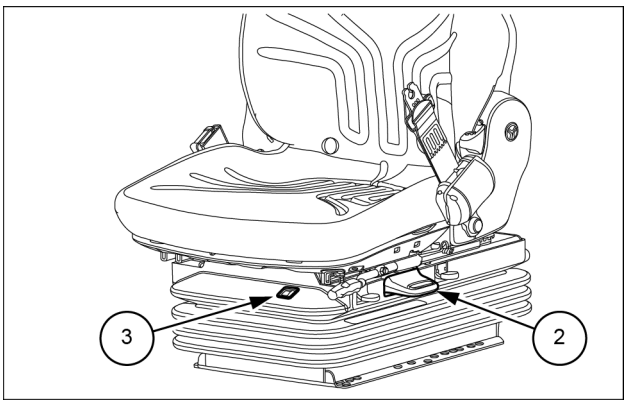


LEIL14CWL0018AB 1

Height and weight adjustment

Use the handle **(2)** to adjust the height of the seat. Lift or drop the seat to desired position. The seat will lock into the required position.
Use the handle **(2)** to adjust the seat for the operator weight, too. Lift or press the handle **(2)** to increase or decrease the weight resistance. Adjust the set according to the operator preference and comfort.

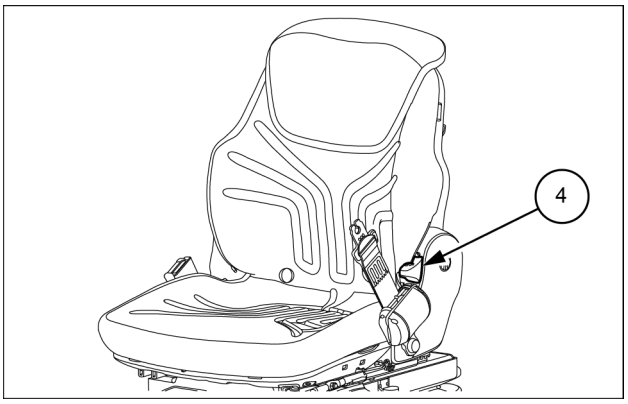
The height/weight indicator **(3)** is located at the bottom front of the seat and shows the adjusted height/weight.



LEIL14CWL0019AB 2

Backrest adjustment

Lift up the backrest adjustment handle **(4)** to move the backrest back or forward. Release the handle **(4)** to lock the backrest into the required position.

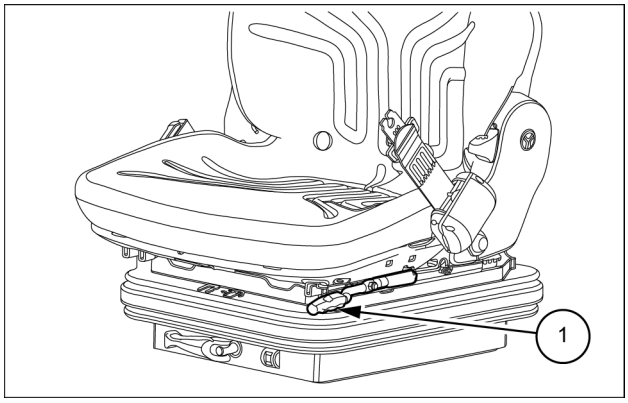


LEIL14CWL0020AB 3

Mechanical seat

Fore-and-aft adjustment

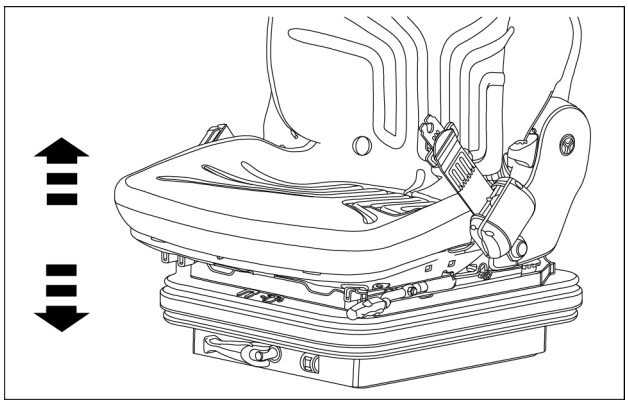
Pull the fore-and-aft adjustment lever **(1)** up and adjust the seat forward or backward as required. Release the lever **(1)** to lock the seat in position.



LEIL14CWL0021AB 4

Height adjustment

Lift the seat to the first, second or third click-stop position, according to operator preference. To lower the seat, first lift the seat to the highest position, then the seat can be lowered to the desired position.
The seat will lock into the desired position.

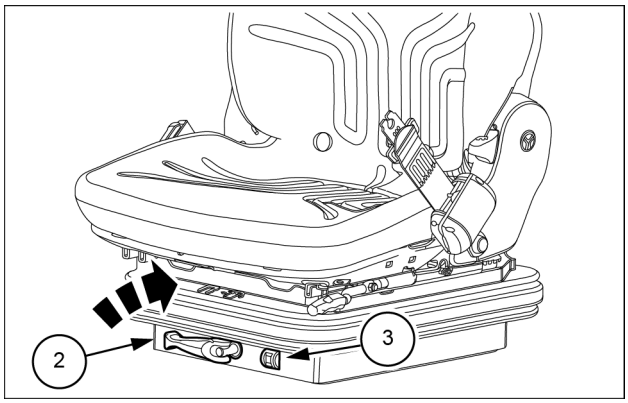


LEIL14CWL0022AB 5

Weight adjustment

Use the weight adjustment lever **(2)** to adjust the seat for the operator weight. Turn the lever **(2)** to increase or decrease the wight resistance. Adjust the seat according to operator preference and comfort.

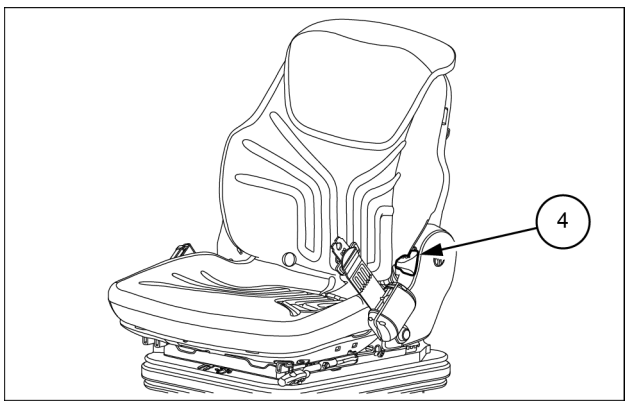
The weight indicator **(3)** is located at the bottom front of the seat and shows the adjusted weight.



LEIL14CWL0023AB 6

Backrest adjustment

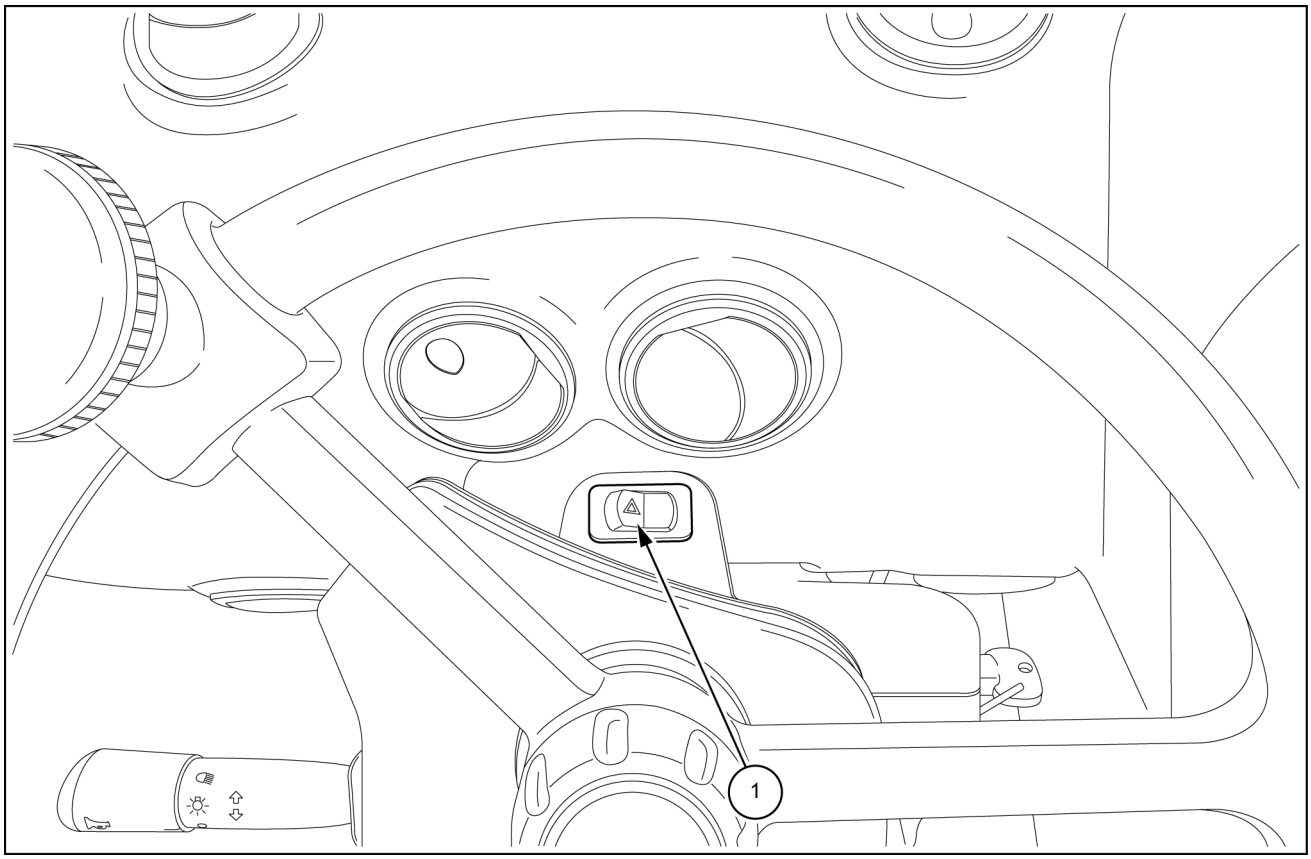
Lift up the backrest adjustment handle **(4)** to move the backrest back or forward. Release the handle **(4)** to lock the backrest into the required position.



LEIL14CWL0024AB 7

Forward controls

Front console



LEIL14CWL0008FB 1

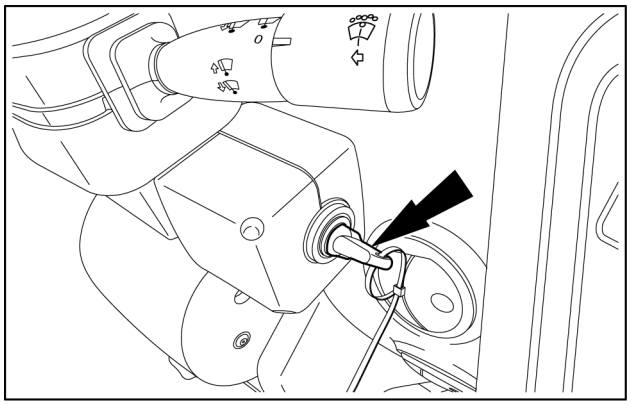
1. Four-way flasher

Push the left hand side of the flasher switch to actuate the flashers. Push the right-hand side of the flasher switch for the OFF position.

Steering column

Ignition switch

The ignition switch has three positions:



LEIL13CWL0001AB 1

1. OFF position

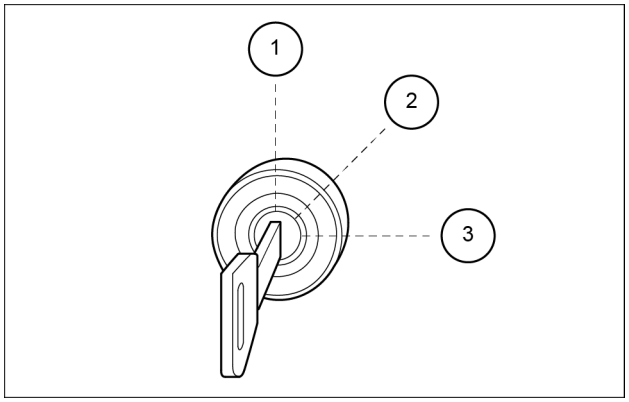
In this position, all switch controlled current is OFF. Turn the key to OFF to stop the engine. Remove the key and turn the Master Disconnect Switch to OFF.

2. ON position

This position will energize all electrical systems. The key will return to this position after you release the key from the start position.

3. START position

Turn the key to this position to engage the starter motor to start the engine. The switch is spring loaded and will return to the ON position when released.



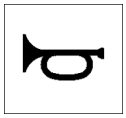
LEIL15CWL0080AB 2

Left-hand lever

⚠ WARNING

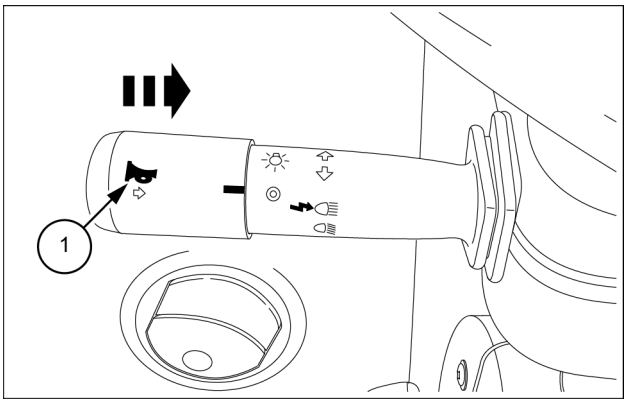
Hazard to bystanders!
Always sound the horn before starting the machine. Make sure the work area is clear of other persons, domestic animals, tools, etc. before you operate the machine. Never allow anyone in the work area during machine operation.
Failure to comply could result in death or serious injury.

W0304A

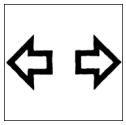


1. Horn

Push the horn lever in to actuate the horn.



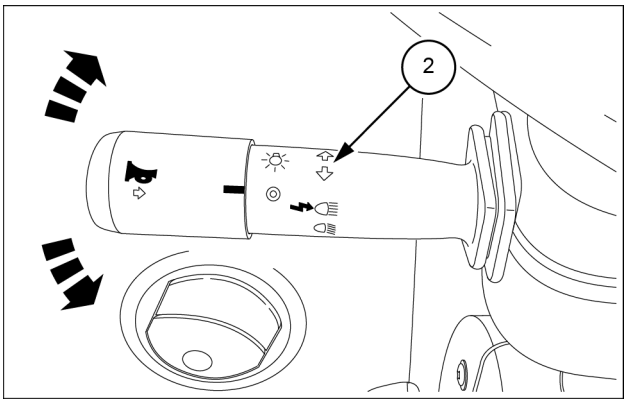
LEIL14CWL0619AB 3



2. Turn signal lever

The direction (turn) indicators are operated (with the key start on) by the left-hand lever.

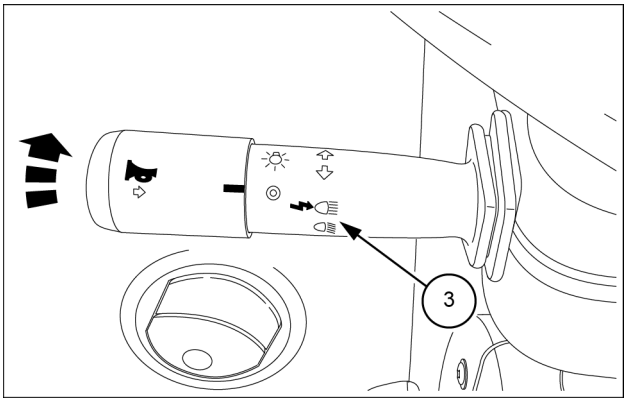
- When pulled UPWARD, the left-hand indicator will flash
- When pulled DOWNWARD from the neutral position, the right-hand indicator will flash



LEIL14CWL0620AB 4

3. High beam/Low beam selector

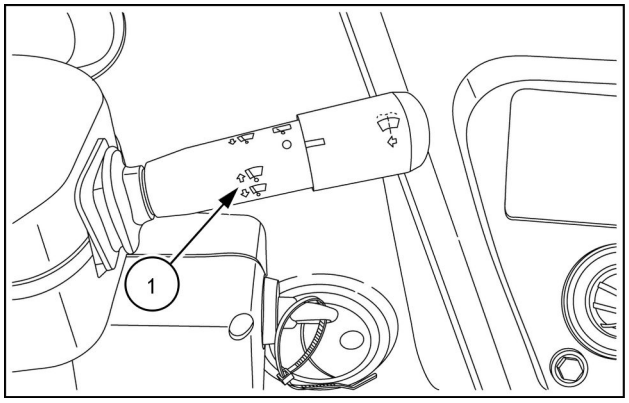
Rotate the end of the left-hand lever to turn on the low beam headlights.
When the low beam headlights are ON, push the left-hand lever forward from the central position to turn on the high beam headlights and the related indicator lamp on the instrument cluster will illuminate.



LEIL15CWL0082AB 5

Right-hand lever

1. Front windshield wiping system

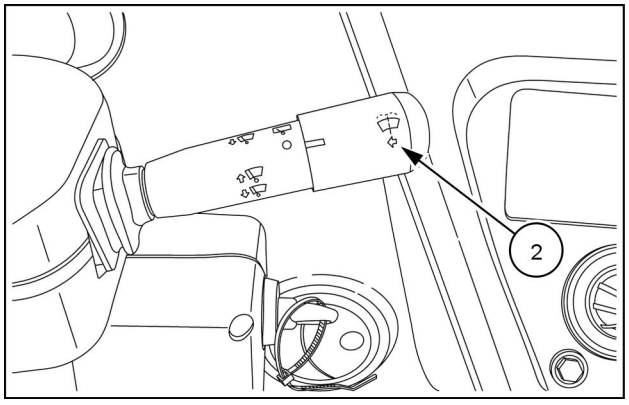


LEIL15CWL0073AA 6

Through the right-hand lever it is possible to activate the front windshield wiping system:

1. Single wiping: move the rotative selector to the upper position and release
2. Timed wiping: move the rotative selector to the lower position (latched), the timed functionality will be activated
3. Continuous wiping, slow speed: move the rotative selector toward the operator (first latched position), the continuous functionality at slow speed will be activated
4. Continuous wiping, fast speed: a further movement of the rotative selector toward the operator (second latched position) will active the continuous functionality at fast speed.

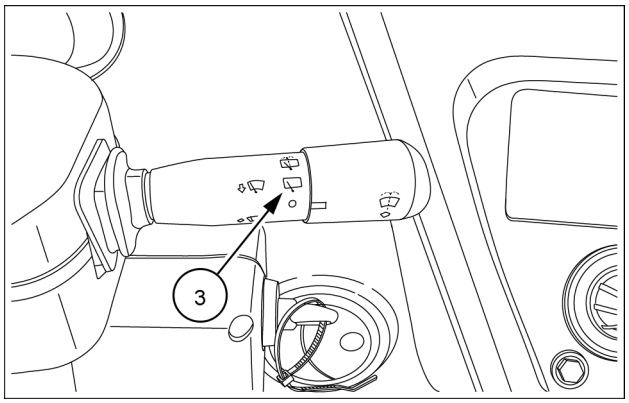
2. Front windshield washer



LEIL15CWL0073AA 7

Push the right-hand lever in the longitudinal direction, the washer pump will be activated with a single wiping.

3.Rear windshield wiping system

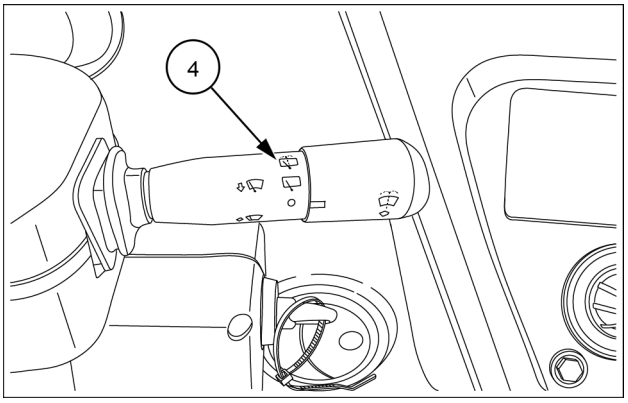


LEIL15CWL0083AA 8

Through the right-hand lever it is possible to activate the rear windshield wiping system.
Move the rotative selector on the right-hand lever to the first position (latched) and the timed wiping functionality will be activated.

4. Rear windshield washing

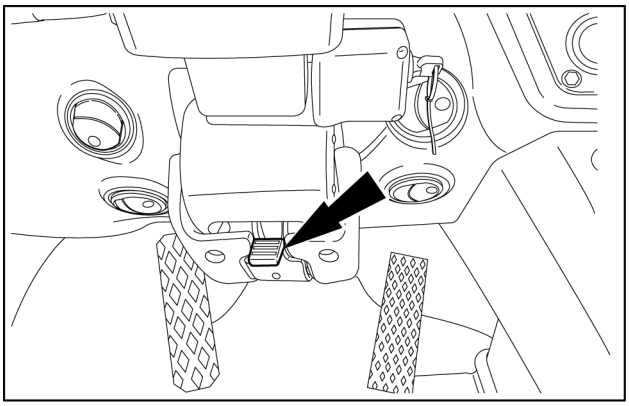
Move the rotative selector on the right-hand lever to the second position and the washer pump will be activated with a single wiping.



LEIL15CWL0083AA 9

Steering wheel tilt control

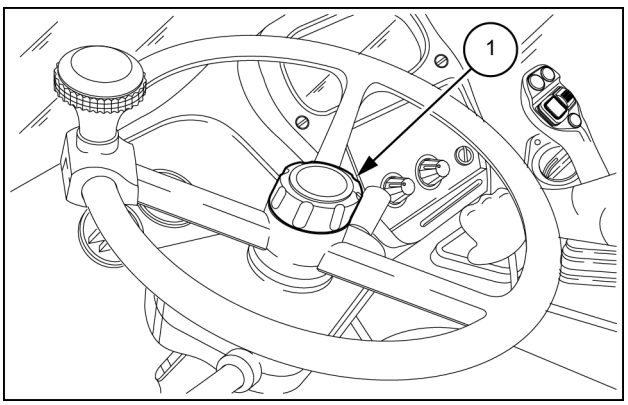
The steering wheel tilt control allows the steering wheel to be adjusted to multiple positions. Pull the handle up, and adjust the steering wheel to the correct and most comfortable angle. Release the control to hold in that position. Tilt the steering wheel completely up when leaving the machine. Always adjust the steering wheel to the correct position before starting the engine.



LEIL13CWL0003AB 10

Telescopic steering adjustment (only for deluxe cab)

Rotate to 1/4 turn the knob **(1)** to adjust the height of the steering column. Do not adjust the steering column during travel. Always adjust the steering column to the correct position before starting the engine.



LEIL15CWL0084AB 11

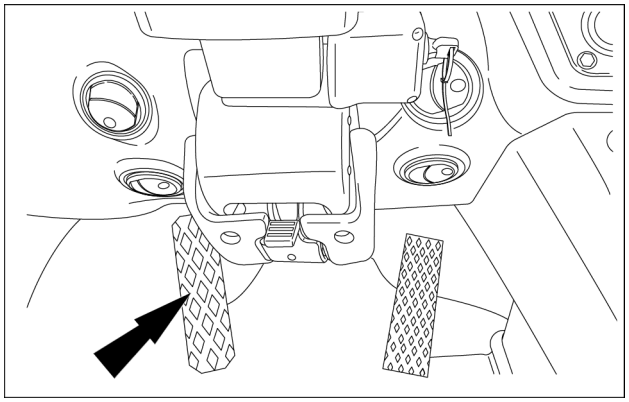
Pedals

Brake and inching pedal

The brake pedal will actuate the machine brakes when pushed.

NOTICE: *on steep slopes, the use of the turtle mode of the transmission is recommended to aid braking and to help prevent brake overheating and premature disc wear.*

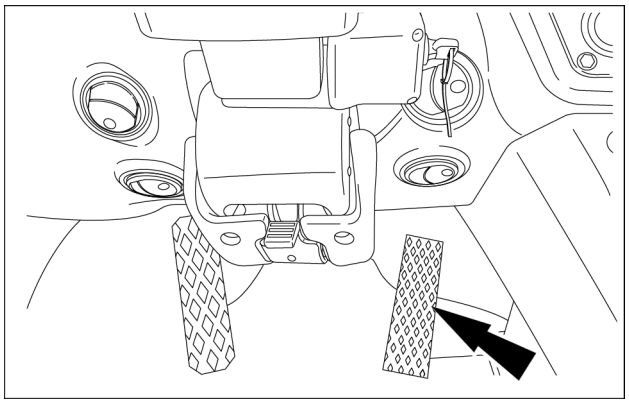
The brake pedal allows also to actuate the inching function. When the pedal is pushed slightly, the vehicle travelling speed is reduced without reducing the engine rpm. Inching allows to perform precise movements even when the engine is running at high rpm.



LEIL14CWL0056AA 1

Throttle pedal

Push the foot throttle to increase engine speed. When the pedal is released, engine speed decreases.



LEIL14CWL0056AA 2

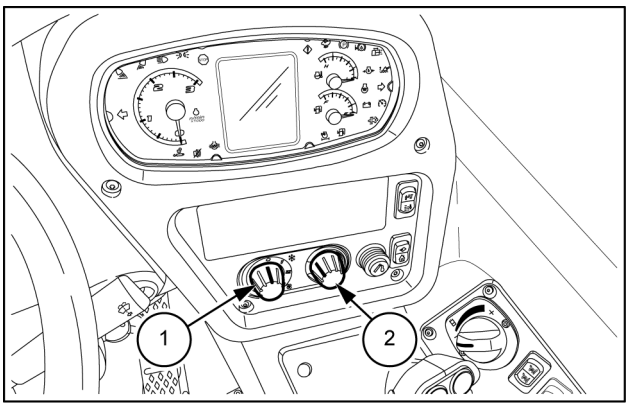
Climate controls

Ventilation control

The fan and heating system control panel is located on the right–hand side of the cab next to steering column.

There is a four-speed blower for heat circulation inside the cab, controlled by the knob **(1)**.

Turn the knob **(1)** clockwise for higher fan speed. and adjust the control to the desired speed. The knob **(1)** has five positions: OFF, 1, 2, 3, and 4. Turn the knob to 4 for maximum speed and to 1 for the lowest speed. Turn completely counterclockwise for OFF.



LEIL14CWL0069AB 1

Heating control

The temperature of the air coming from the heater is controlled by the control knob **(2)**. Turn the knob clockwise to increase air temperature or turn counterclockwise to reduce it. Blue markings indicate cooler temperatures. Red markings indicate warmer temperatures when using the heater. To heat the cab, the engine must be running and at a sufficiently high operating temperature.

Air-conditioning (optional)

To switch on the air-conditioning system, press the knob **(1)**. Turn the knob **(2)** counterclockwise to decrease the air temperature and turn the knob **(1)** clockwise to vary the fan speed.

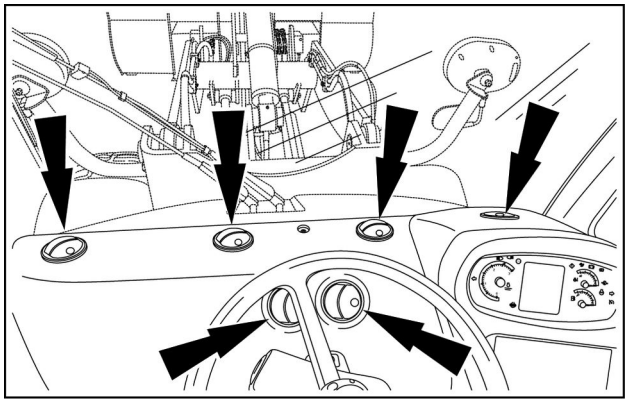
Maximum cooling condition is obtained with the knob **(2)** turned completely counter clockwise and with the knob **(1)** turned completely clockwise (4th speed).

***NOTE: R134A** is the only coolant acceptable to your machine air-conditioning system.*

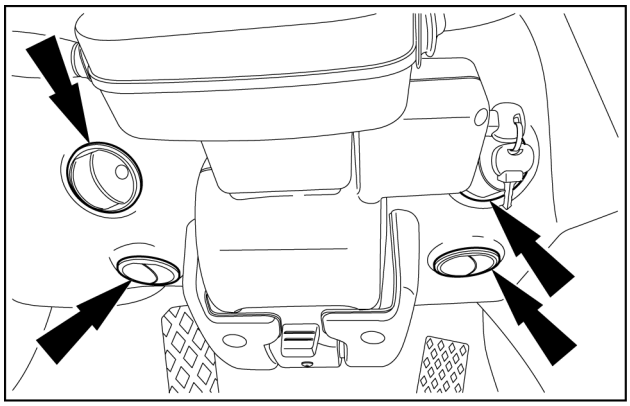
***NOTICE: R134A** can be dangerous if improperly handled. **R134A** has a boiling point of - **12 °C**. Never expose any part of the air-conditioner system to flame or excessive heat because of the risk of fire, explosion or production of phosgene gas. Never disconnect or disassemble any part of the air-conditioning system because escaping coolant can cause frostbite. If the coolant comes in contact with the skin use the same treatment used in the event of frostbite. Warm the area with your hand or lukewarm water (**32 °C**), cover the area loosely with a bandage to protect the affected area against infection and consult a doctor immediately. If coolant contacts the eyes wash immediately with cold clean water for at least **5 min** and consult a doctor immediately.*

Main air louvers

The louvers on the console direct air flow toward the operator or toward the front window.

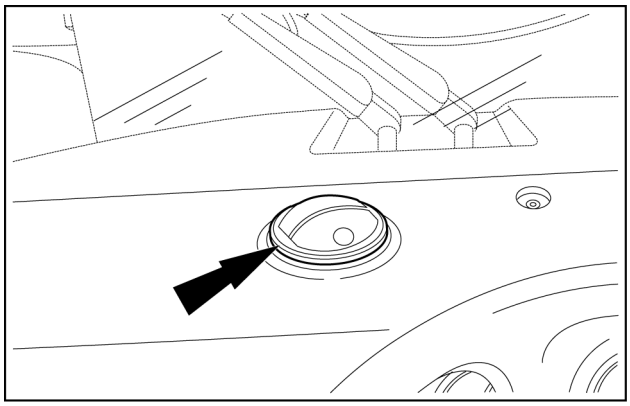


LEIL14CWL0009AA 2



LEIL14CWL0010AB 3

Adjustments can be made to direct the air flow of the louvers.



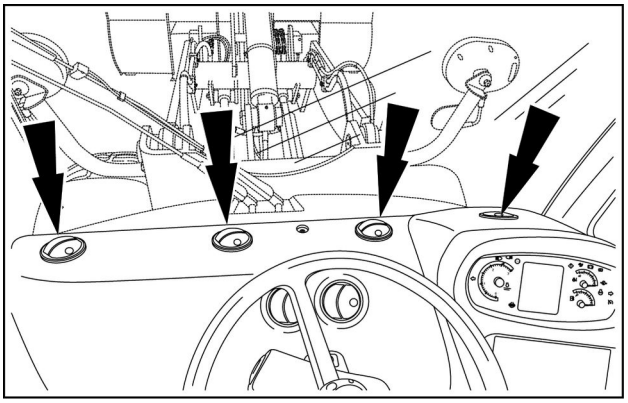
LEIL14CWL0011AB 4

Defrosting

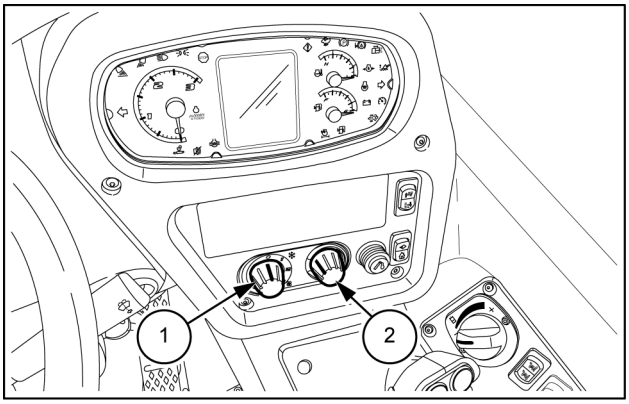
The upper louvers under the front windshield on the console direct the air flow to defrost the windows.

To get maximum air flow on the windows, close all other louvers and turn the blower fan knob **(1)** to the highest speed.

In the event of fogging conditions, if equipped with the air conditioning system, turn the air conditioning ON and turn the heat control knob **(2)** completely clockwise.



LEIL14CWL0009AA 5



LEIL14CWL0069AB 6

Left-hand side controls

Parking brake

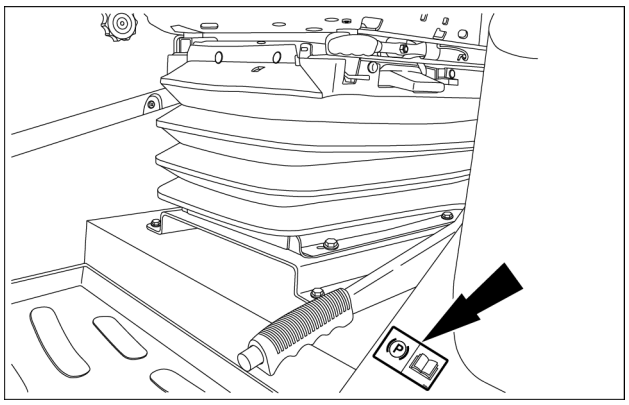
⚠ DANGER

Run-over hazard!
Apply the parking brake before leaving the cab.
Failure to comply will result in death or serious injury.

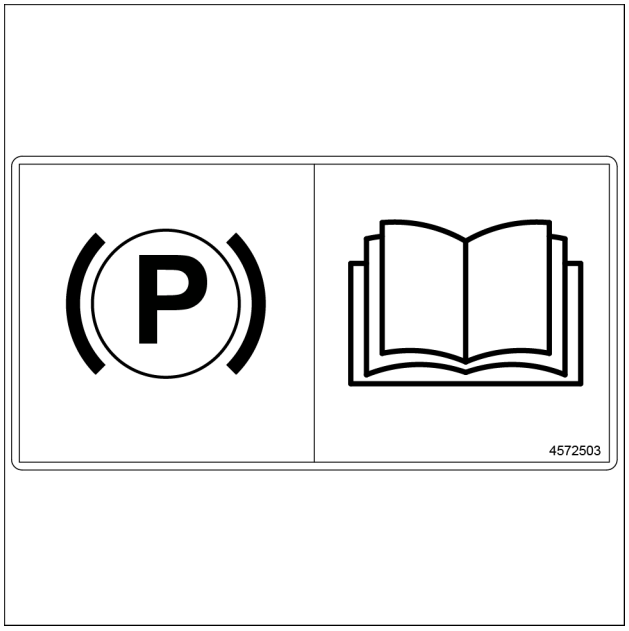
D0028A

Make sure the machine has come to a complete stop before applying the parking brake.

The parking brake is located below the operator on the left-hand side, as shown by the decal near the courtesy compartment on the left-hand side.



LEIL15CWL0064AB 1



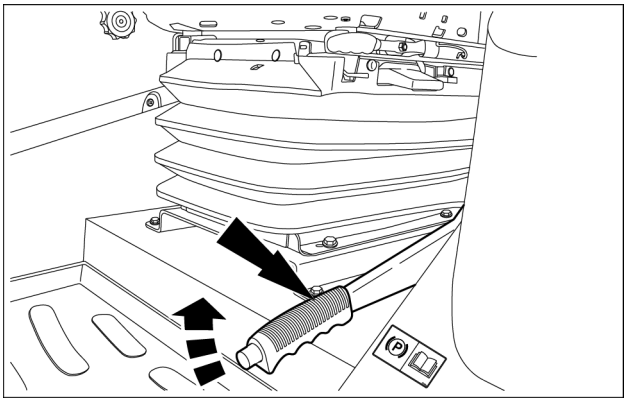
4572503 2

Parking brake engagement

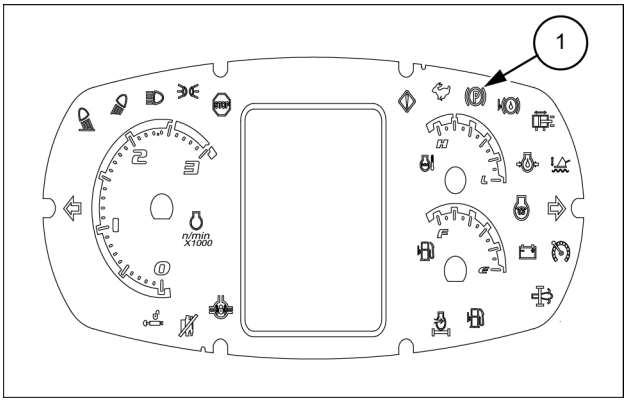
To engage the parking brake, place the joystick switch of the direction shift in NEUTRAL and pull the parking brake lever upwards.
When the parking brake is engaged, the indicator lamp **(1)** of the instrument cluster is illuminated.

NOTICE: *a failure in the operating procedure can result in abrupt engagement of the parking brake. Always wear your seat belt.*

NOTICE: *always engage the parking brake before leaving the cab.*



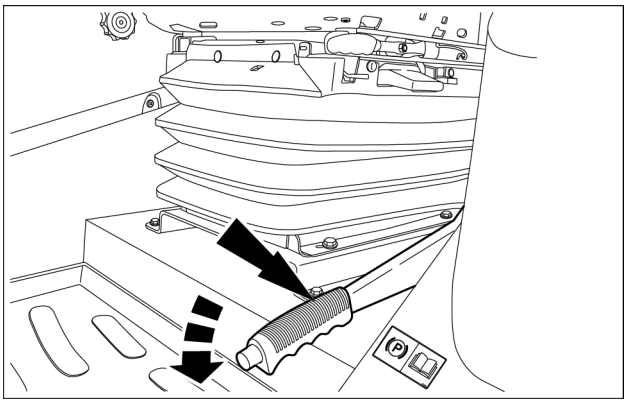
LEIL15CWL0062AB 3



LEIL14CWL0058AB 4

Parking brake release

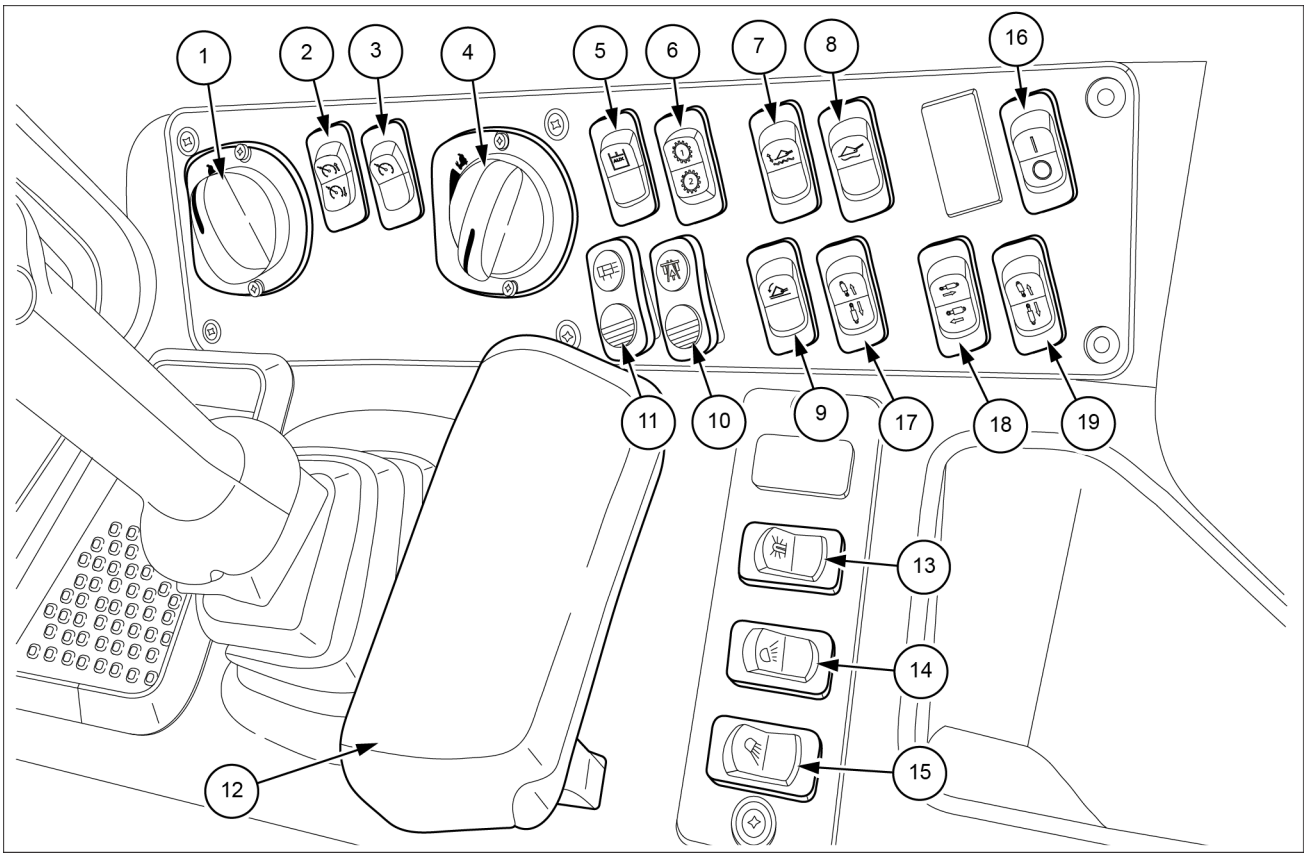
To release the parking brake, press the button on the top of the parking brake and pull the parking brake downwards.
The indicator lamp **(1)** is OFF when the parking brake is released.



LEIL15CWL0063AB 5

Right-hand side controls

Side console overview



LEIL15CWL0061FB 1

The side console allows the operator to make adjustments to machine operation and functions.

1. Hand rpm knob
2. Creep speed shift switch (optional)
3. Creep speed switch (optional)
4. High Flow knob (optional)
5. High Flow enable switch (optional)
6. I/II gear switch (only “High speed” models)
7. Ride Control switch (optional)
8. Float switch
9. Return-to-dig switch (optional)
10. “Road mode” enable switch
11. Quick Coupler switch
12. Wrist rest
13. Rotary beacon (optional)
14. Front work light switch (optional)
15. Rear work light switch (optional)

Front electrical socket switches (optional)

The switch **(16)** is a stable switch which allows to activate a continuous function.

The switches **(17)**, **(18)** and **(19)** are three unstable switches to get related movements depending on the equipped special tool (see “Attachments”- Chapter 9 for more information about the special tools).

Joystick

NOTE: *this subsection shows all the functions of the "full optional" joystick version.*

Lift arm and bucket control

The joystick is located in the right-hand side console. It controls the lift arm and bucket functions.

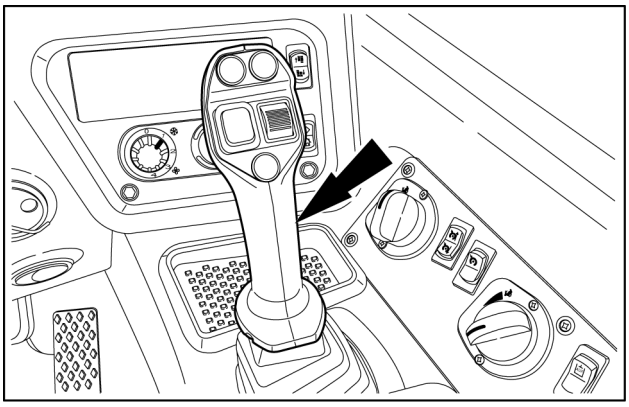
A. Lower the lift arm

B. Dump the bucket

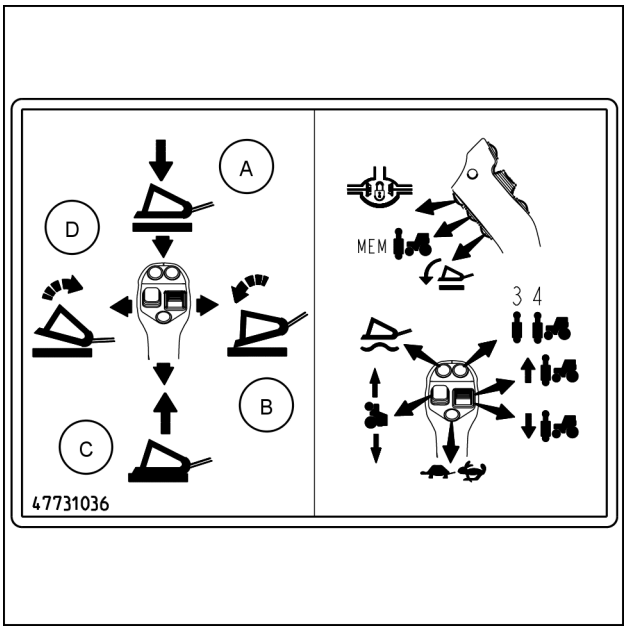
C. Raise the bucket

D. Rollback the bucket

The neutral central position of the joystick is called HOLD position. When the joystick is in the HOLD position, the loader arm and bucket will not move.
When released from any position, the joystick will automatically return to the HOLD position.



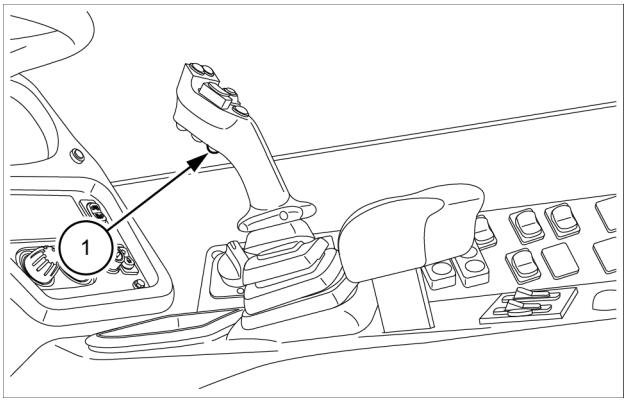
LEIL14CWL0003AB 1



47731036 2

The Return-to-dig button **(1)** is located on the back of the joystick and allows the operator to actuate the Return-to-dig function.

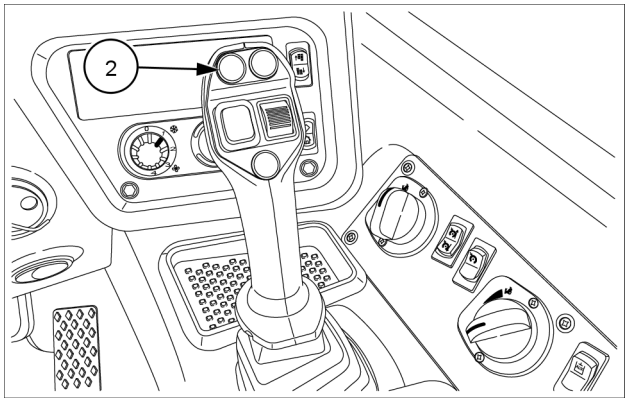
NOTE: *see "Loader functions" – Chapter 4 for more information about the Return-to-dig function.*



LEIL14CWL0403AB 3

The float button **(2)** allows the operator to actuate the float function.

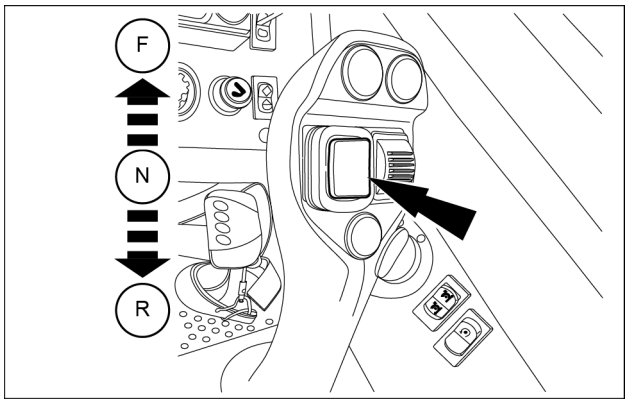
NOTE: *see "Loader functions" – Chapter 4 for more information about the float function.*



LEIL14CWL0084AA 4

Direction shift switch

The direction shift switch enables the selection of the machine travel direction: FORWARD, NEUTRAL and REVERSE.



LEIL14CWL0085AB 5

Differential lock button

The button **(3)** allows the operator to lock the differential of the axles, to avoid tires slipping . To activate the differential lock, carry out the following procedure:

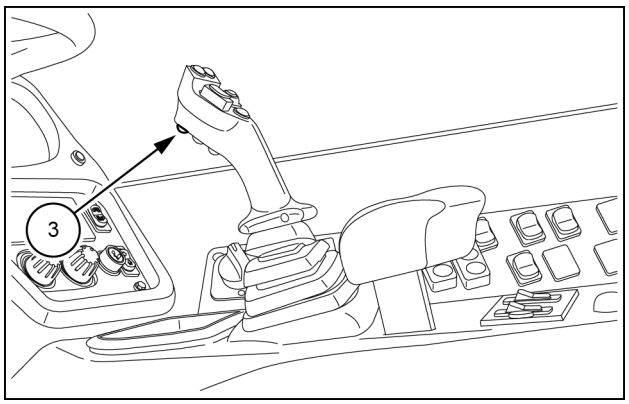
- Before engaging the differential lock make sure neither wheel is spinning. Engage the differential lock only at **0 km/h**.
- To engage the differential lock press and keep pressed the differential lock button **(3)**.
- To disengage the differential lock, release the differential lock button **(3)**.

Deactivate the differential lock in steering condition.

This control is therefore useful to stop a possible slip of the wheels.
This lock remains engaged until the unlocking control is activated.

NOTICE: *never use the differential lock at speeds above* ***5 km/h*** *(****3.1 mph****) or at any time when turning the machine.*

NOTE: *see "Differential lock" – Chapter 4 for more information about the differential lock.*

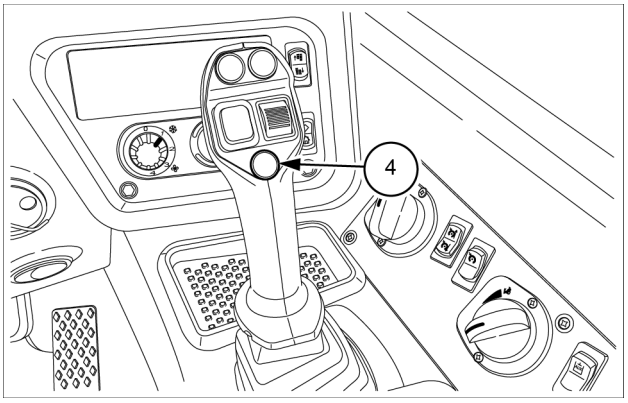


LEIL13CWL0008AB 6

Low/high range speed (turtle/rabbit) button

The button **(4)** allows the operator to change the travel speed range of the machine. Two travel speed ranges can be chosen: low range speed (turtle) and high range speed (rabbit).

The high range speed (rabbit) can be changed to low range speed (turtle) only if the machine speed is below **10 km/h** (**6.2 mph**).



LEIL13CWL0015AB 7

3rd /4th hydraulic function control

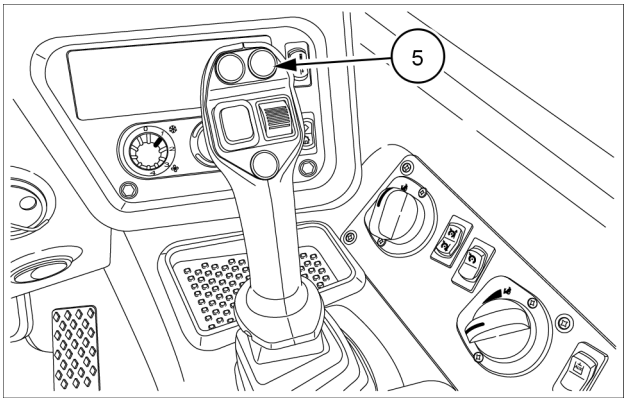
The button **(5)** allows the operator to switch from the 3rdto the 4th hydraulic function, or vice versa.

To switch from the 3rd to the 4th hydraulic function, the 3rd/4th function push button **(5)** must be pressed by the operator. Any time the push button **(5)** is pressed and then released, the function is changed from 3rd to 4th or vice versa.

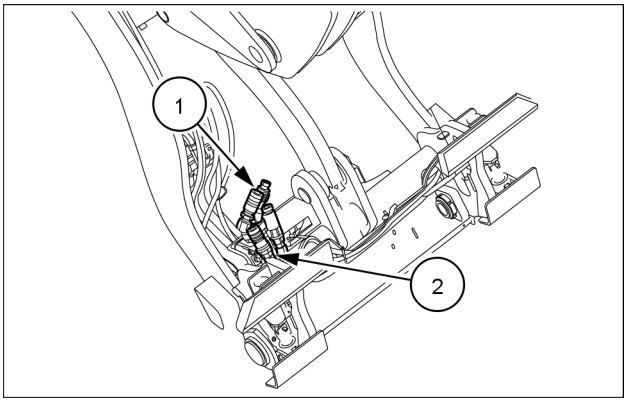
3rd HYDRAULIC FUNCTION: it is the function for the oil supply to the attachment and enables the Quick Coupler engagement/disengagement.

4th HYDRAULIC FUNCTION: it is an additional function switchable from the 3rd one, which supplies a hydraulic oil flow on a second hydraulic line (if equipped) to the attachment. This function, for example, can be used to adjust the orientation of an accessory attachment (a sweeper for example).

1. 3rd function
2. 4th function



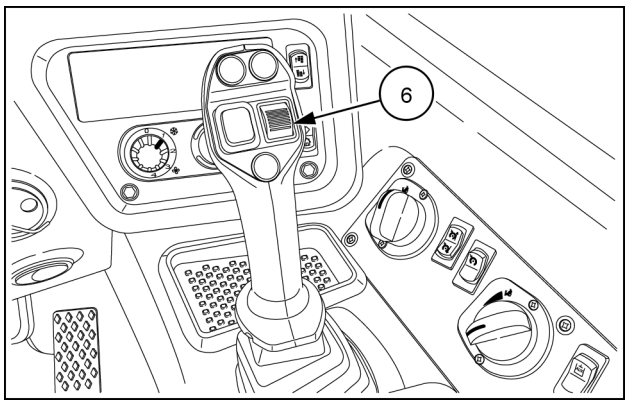
LEIL14CWL0084AA 8



LEIL15CWL0341AB 9

The roller **(6)** allows the operator:

- To choose the direction of the flow rate of the selected function (3rd or 4th)
- To adjust the flow rate of the selected function (3rd or 4th)
- To extract or retract the coupler locking pins.



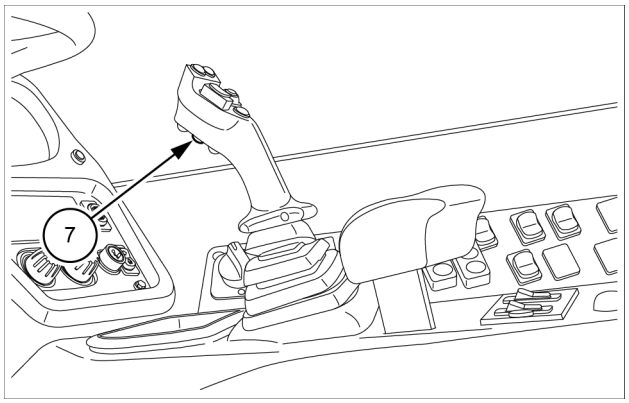
LEIL14CWL0084AA 10

Flow rate Memory button

The button **(7)** is located on the back of the joystick and allows the operator to activate/deactivate the Flow rate Memory function. This function can be activated only for the 3rd hydraulic function.
When the Flow rate Memory function is activated, it provides the maximum continuous oil flow to the tool installed on the hydraulic coupler.

To activate the Flow rate Memory function, move the roller **(6)** (forward or backward) to choose the flow rate direction, then press the button **(7)** to set the flow direction at maximum value.

The Flow rate Memory function is deactivated when the button **(7)** is pressed again or when the 3rdhydraulic function is switched to the 4th.



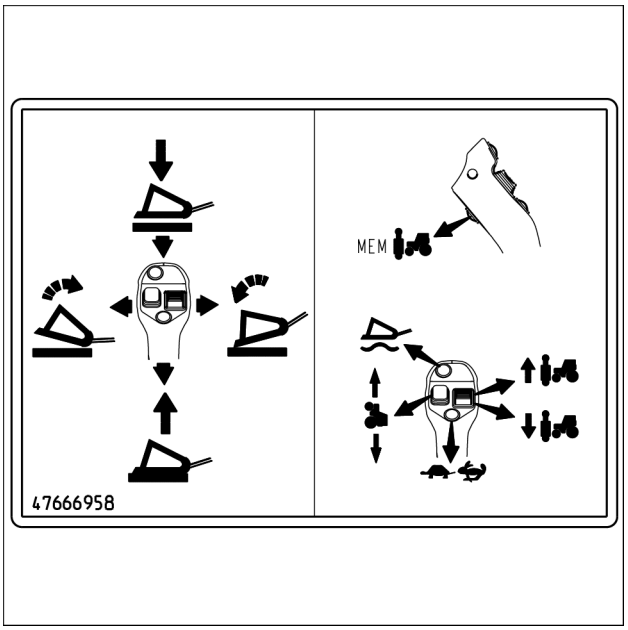
LEIL14CWL0088AB 11

Joystick versions

In this subsection the other joystick versions are shown. The respective decals summarize the functions for each joystick version.

Joystick version 1

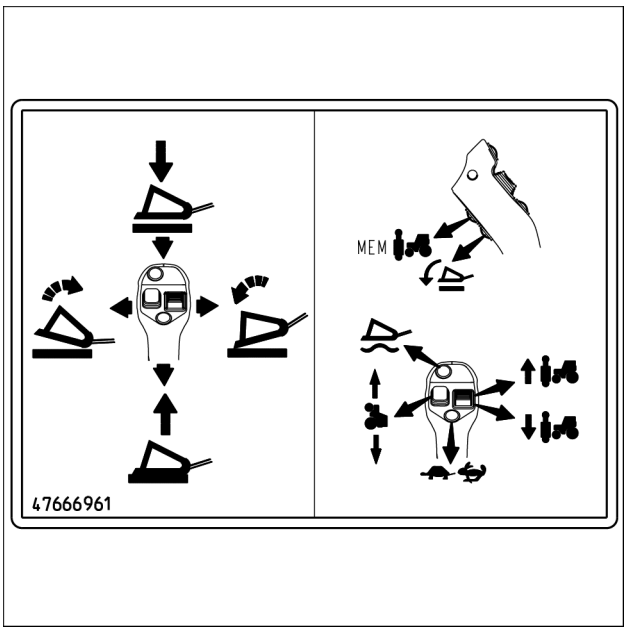
- Float function
- Direction shift
- Low/high (turtle/rabbit) range speed
- Hydraulic function control (roller)
- Flow rate Memory



47666958_B 12

Joystick version 2

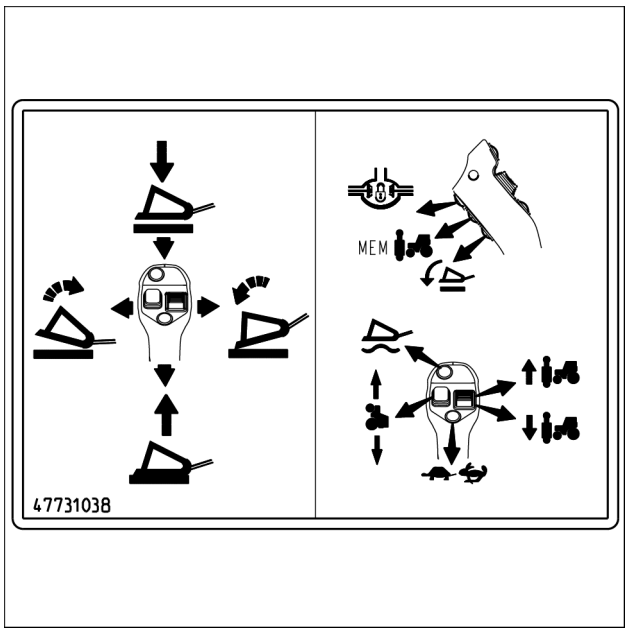
- Float function
- Direction shift
- Low/high (turtle/rabbit) range speed
- Hydraulic function control (roller)
- Flow rate Memory
- Return-to-dig



47666961_B 13

Joystick version 3

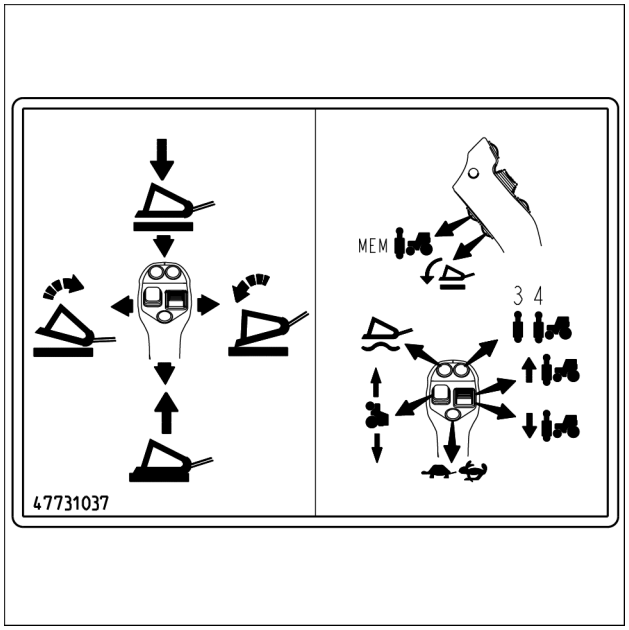
- Float function
- Direction shift
- Low/high (turtle/rabbit) range speed
- Hydraulic function control (roller)
- Flow rate Memory
- Return-to-dig
- Differential lock



47731038_B 14

Joystick version 4

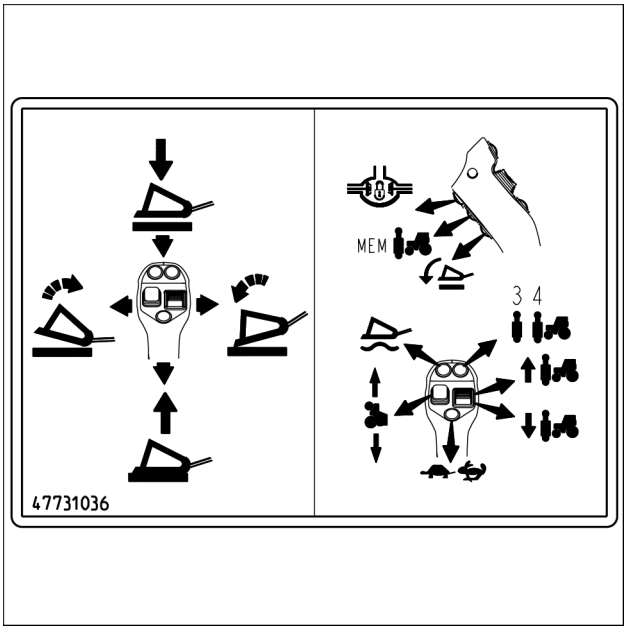
- Float function
- Direction shift
- Low/high (turtle/rabbit) range speed
- Hydraulic function control (roller)
- Flow rate Memory
- Return-to-dig
- 3rd/4th hydraulic function



47731037 15

Joystick version 5 (full option)

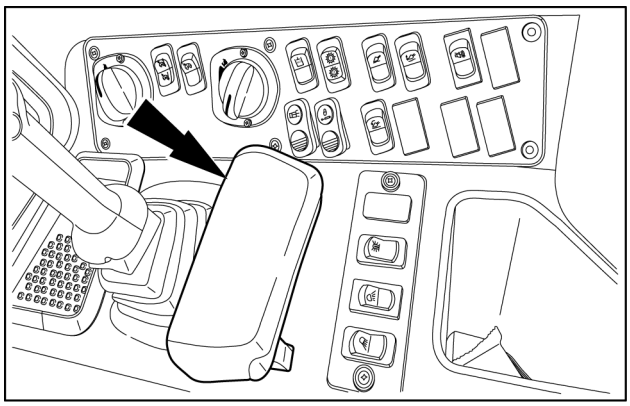
- Float function
- Direction shift
- Low/high (turtle/rabbit) range speed
- Hydraulic function control (roller)
- Flow rate Memory
- Return-to-dig
- 3rd/4th hydraulic function
- Differential lock



47731036 16

Wrist rest

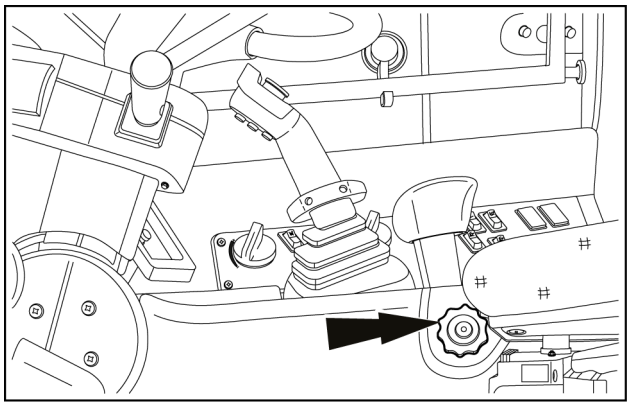
Adjust the wrist rest to a comfortable height to operate the loader control lever.



LEIL14CWL0006AB 1

Adjustment knobs:

To adjust the wrist rest, loosen the adjustment knob. Adjust the wrist rest to a comfortable height. The wrist rest can be raised and lowered.

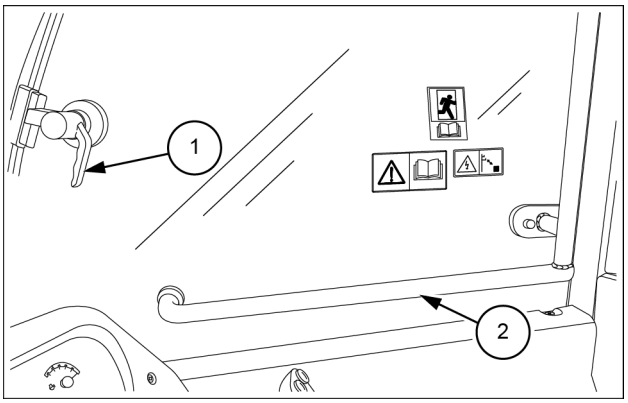


LEIL14CWL0007AB 2

Side window

Base cab

Pull the handle **(1)** to open the window on the right-hand side from the inside of the cab. Use the handrail **(2)** to push the window outwards.

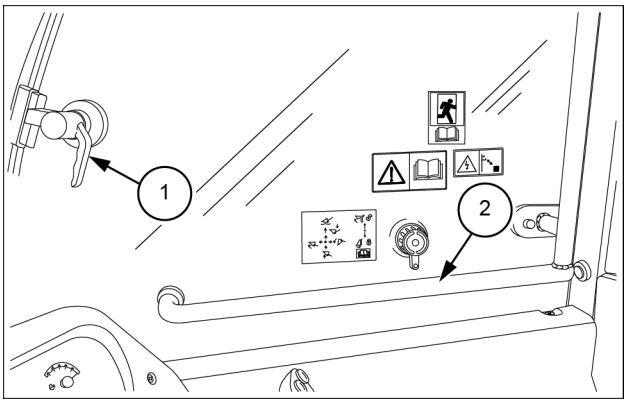


LEIL14CWL0643AB 1

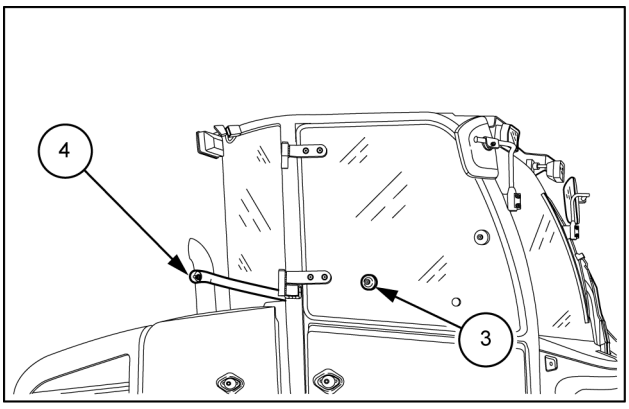
Deluxe cab

Pull the handle **(1)** to open the window on the right-hand side from the inside of the cab.

In the deluxe cab version, the window may be opened and locked against the side of the cab. To open and lock the window, pull the handle **(1)** and use the handrail **(2)** to push the window back to the rear of the cab until the catch **(3)** locks against the locking pin **(4)**.

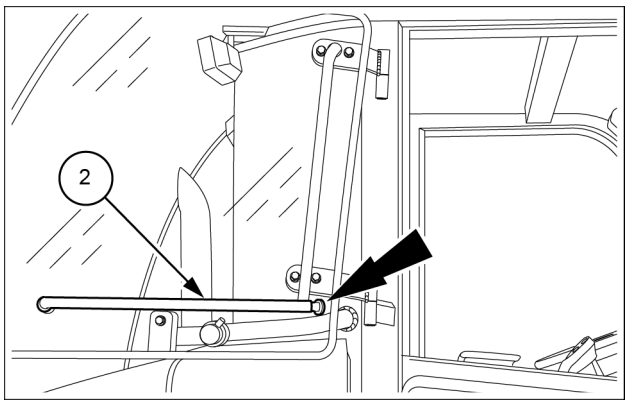


LEIL15CWL0071AB 2



LEIL14CWL0039AB 3

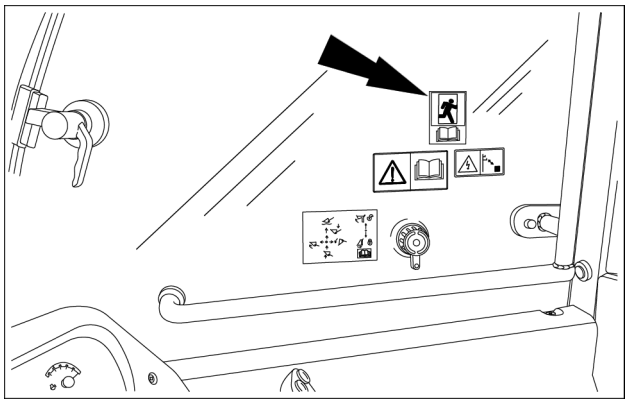
To release the window from the full open position, pull on the window release on the right-hand side, which protrudes out of the handrail **(2)**.



LEIL14CWL0040AB 4

Emergency exit

The right-hand window of the cab can be used as an emergency exit. Be proactive and open and close the emergency window exit as a safety measure to become familiar with its operation.

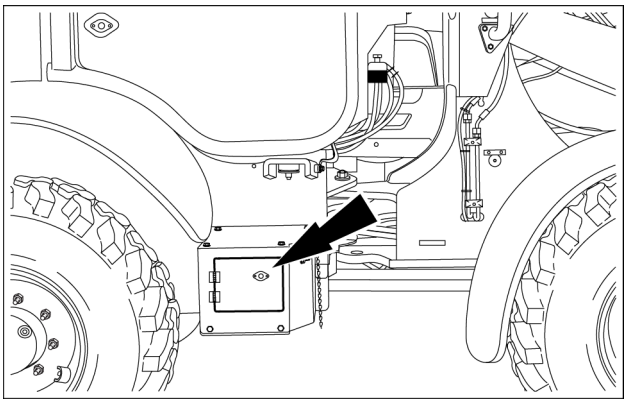


LEIL15CWL0070AA 5

Exterior controls

Battery main switch

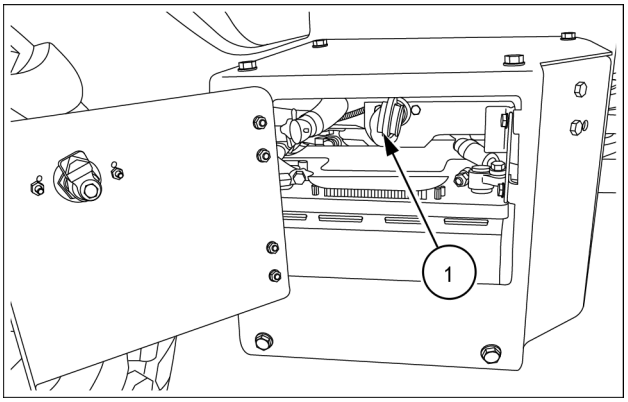
The battery main switch is located on the right-hand side of the machine, below the operator's compartment.
Open the outer panel to access the battery main switch.
The battery main switch has two positions: ON and OFF.



LEIL14CWL0633AB 1

Battery main switch ON

The battery main switch **(1)** in the ON position energizes the entire electrical system. When the battery main switch **(1)** is ON and the key switch is in the OFF position, the position light, the horn, the four-way flashers and the rotary beacon switches, the dome lamp, the cigar lighter and the radio are powered and functional.

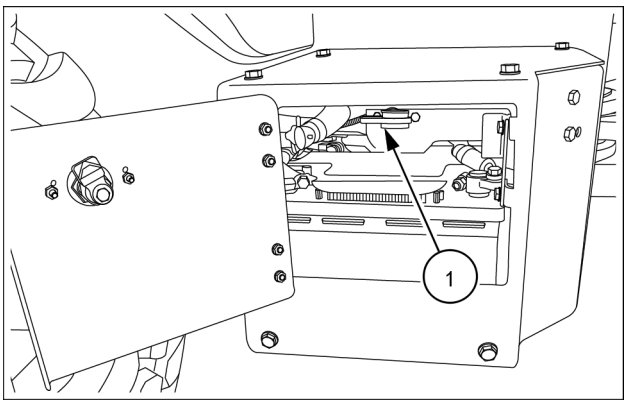


LEIL14CWL0625AA 2

Battery main switch OFF

In the OFF position, all machine power is interrupted.

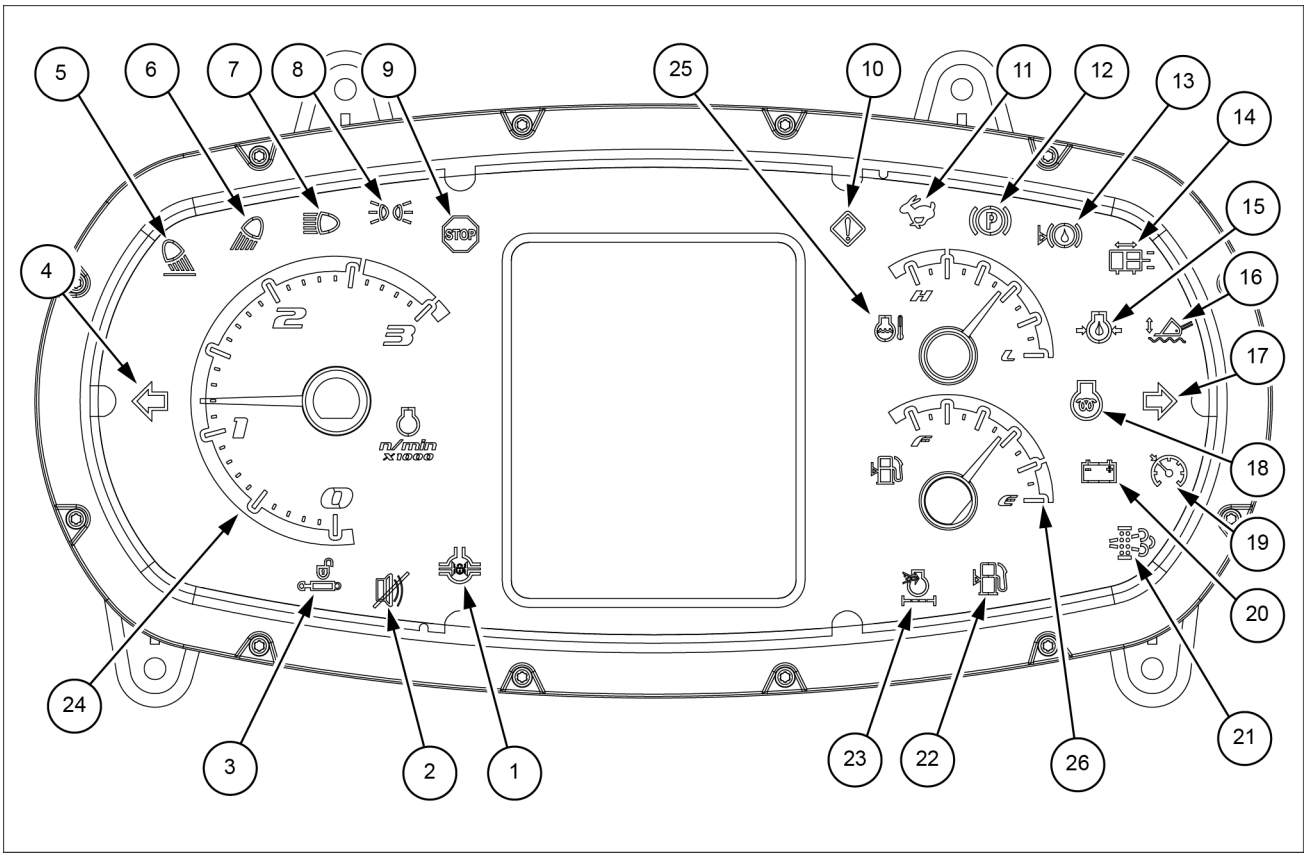
NOTICE: *DO NOT use the battery main switch **(1)** to stop the engine.*



LEIL14CWL0624AA 3

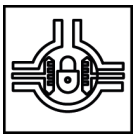
Instrument cluster

Overview



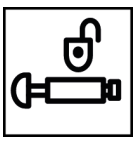
LEIL15CWL0069FB 1

Instrument cluster indicator lamps

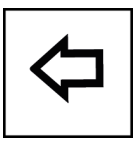


1. Differential lock

2. Backup alarm disabled (not used)



3. Main hydraulic enabled



4. Turn left

5. Rear work lights

6. Work lights

7. Main high beam

8. Side lights

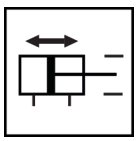
9. Stop

10. Warning

11. Working speed range (rabbit range)

12. Parking brake applied

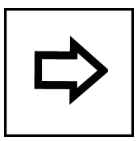
13. Brake fluid level



14. Quick Coupler on

15. Engine oil pressure

16. Ride Control on

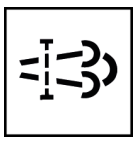


17. Turn right

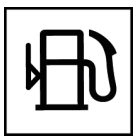
18. Glow plug

19. Creep Speed

20. Alternator charging



21. DPF regeneration (not used)



22. Low fuel level

23. Air filter clogging

Instrument cluster gauges

24. Tachometer (engine speed)

25. Engine coolant temperature

26. Fuel level

Keypad

The key pad is located in the side console, to the right-hand of the steering wheel. Use this key pad to move from one screen to another, choose various selections, monitor the machine functions, and retrieve information.

All selections made with the computerized technology of the Dot Matrix Display (DMD) screen are essentially programmed in the same manner.

When using the screen, use the arrow keys **(C)** and **(D)** to scroll to the desired selection, highlight that selection and press the confirm/enter key **(B)**.

Follow any screen prompts when given and use the confirm key to enter the selection. Use the escape key **(A)** to return to the main menu. This will lock the chosen selection into memory.

All functions can be accessed in the same basic manner.

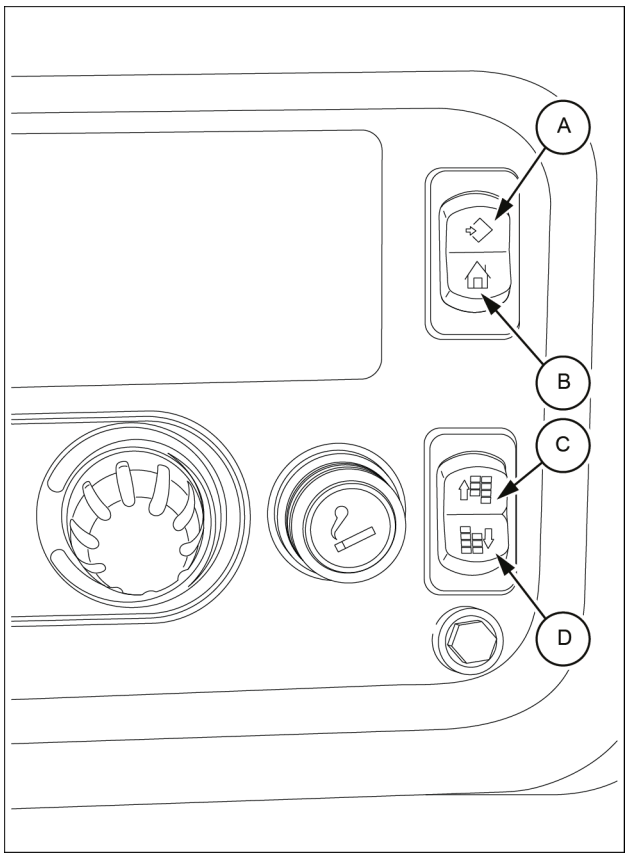
A. Escape/home key - Use this key to exit and return to the driving screen. This key can be used anytime to start over and begin again or to exit a field. It can also be used to electronically check fault codes.

B. Enter/confirm key - Use this key to confirm selections: After selections have been highlighted, use the enter/confirm key to choose selections.

C. Up arrow key - Use this key to scroll up to selections.

D. Down arrow key - Use this key to scroll down to selections.

NOTE: *arrows on the screen will indicate if selections are up or down from the current selection.*



LEIL16CWL0587BB 1

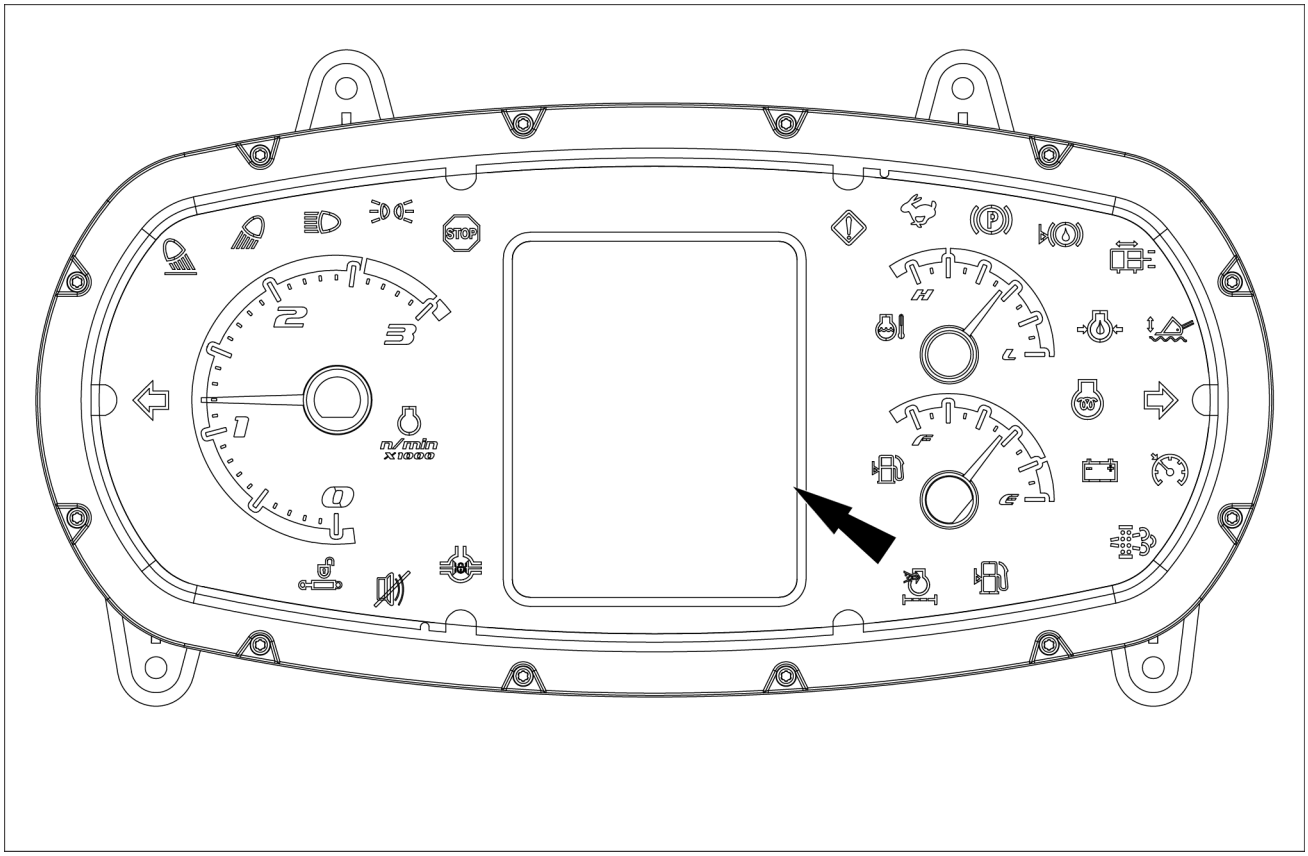
Using the arrow keys

At any time during operation or with the key switch ON, the operator may scroll through four information screens and two trip screens by using the arrow keys **(C)** and **(D)**. These screens are in a circular loop and may be accessed by pressing the up or down key. The following sequence shown uses the down key only.

NOTE: *pressing the escape key will return the DMD back to the normal driving screen. In order to lock the changes into memory, the operator must press the confirm key, then use the escape key to return to the main screen. Turning the machine off will also lock the settings into memory.*

Display

Dot Matrix Display (DMD) multi-function display



LEIL15CWL0072FA 1

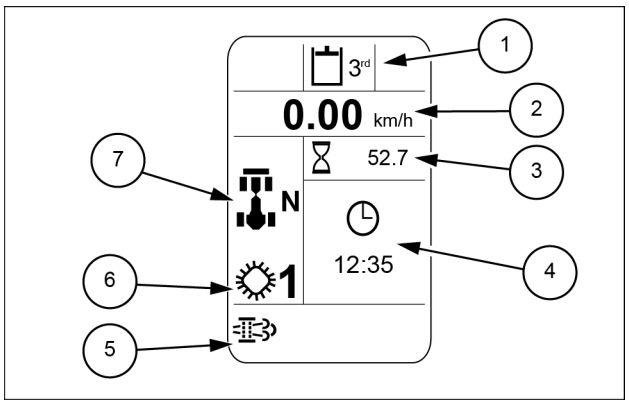
The Dot Matrix Display (DMD) multi-function display is located at the center of the modular dashboard, on the right-hand of the steering column. On start up, the console indicator lamps will momentarily flash. The DMD display will flash the machine model. The initial standard driving screen will then appear. Once operator preferences are set, the screen will reflect those selections.

NOTE: *upon initial startup, the operator can push the return/ escape key, and the language selection screen will appear immediately. This allows the operator to make a language selection without having to use an unknown language to scroll through to preferences.*

Information will be displayed on the DMD as directed by the operator or automatically by machine operations. The screen offers prompts to assist the operator when programming machine functions and or performing diagnostics.

The display is divided into different areas:

1. Hydraulic functions status
2. Vehicle speed
3. Vehicle hours
4. Clock/Active error codes/Creep Speed Memory set-point/Action required
5. After Treatment status
6. Transmission gear engaged
7. Vehicle travelling directions



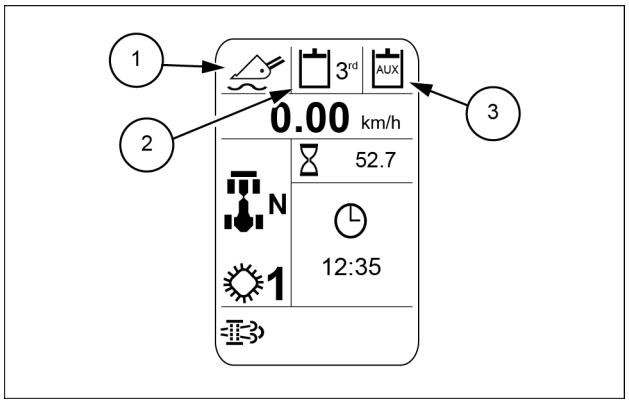
LEIL14CWL0090AB 2

Hydraulic functions status

The display will show the icon **(1)** when the Floating function is activated.

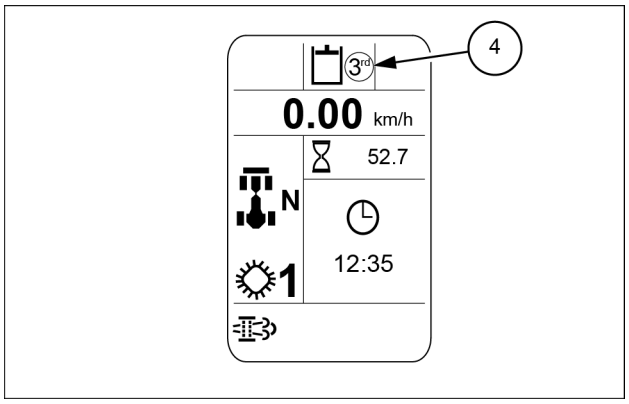
In the middle upper space **(2)**, the display will show the icon of the activated hydraulic function: 3rd or 4th function.

The display will show the icon **(3)** when the auxiliary High Flow function is activated.



LEIL14CWL0092AB 3

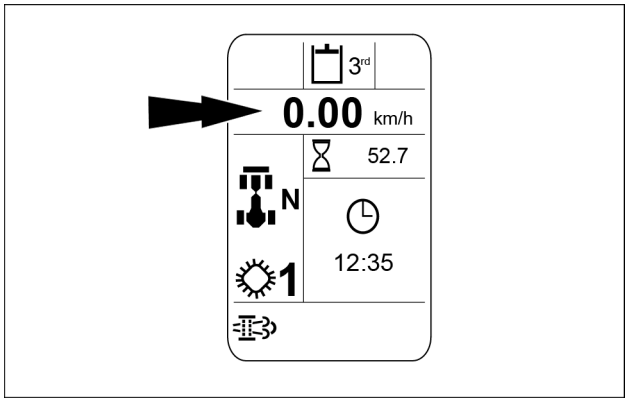
The display will show the icon **(4)** when the 3rd function with the Flow rate Memory functionality is activated.



LEIL14CWL0091AB 4

Vehicle speed

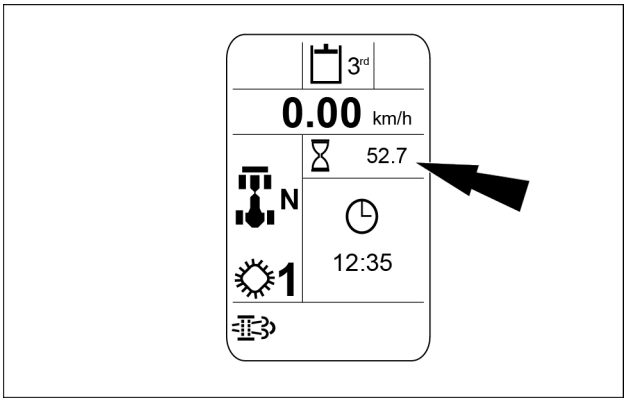
The section below the hydraulic functions status area shows the vehicle speed (km/h or mph). The vehicle speed is shown using the X.XX or the XX.X formats.
Below **1 km/h** (or **1 mph**) speed value, the visualization shall be X.XX.
Between **1 – 10 km/h** (or **1 – 10 mph**) the visualization shall be X.X0.
Above or equal to **10 km/h** (or **10 mph**) the visualization shall be XX.X.



LEIL14CWL0093AA 5

Vehicle hours

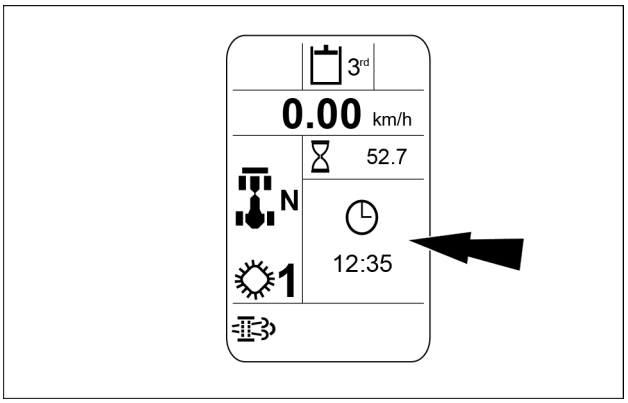
The vehicle hours are displayed below the vehicle speed. The hours shall be increased when the engine is running: the engine shall be considered running when rpm are above than 500. The hours shall be visualized starting from 0.0 to 65535.0 using a step of 6 minutes.



LEIL14CWL0093AA 6

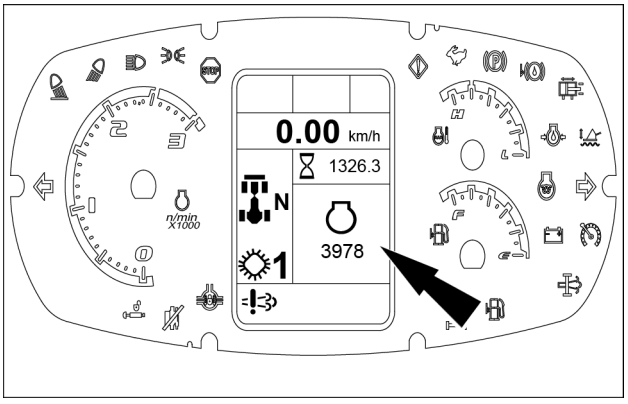
Clock/Active error codes/Creep Speed Memory setpoint/Action required

The Clock is located below the vehicle hours section. The clock symbol is displayed above the clock value. The clock visualization shall be indicated in 12 or 24 hours depending on the setting in the set-up menu.



LEIL14CWL0093AA 7

Error codes are displayed in the part of the DMD reserved to the clock. Error codes are composed by an icon and a code. The icon shall be the one used for the range of that error code.



LEIL14CWL0099AA 8

During the activation of the Creep Speed Memory mode, the speed setpoint is shown on the DMD clock section for some seconds.

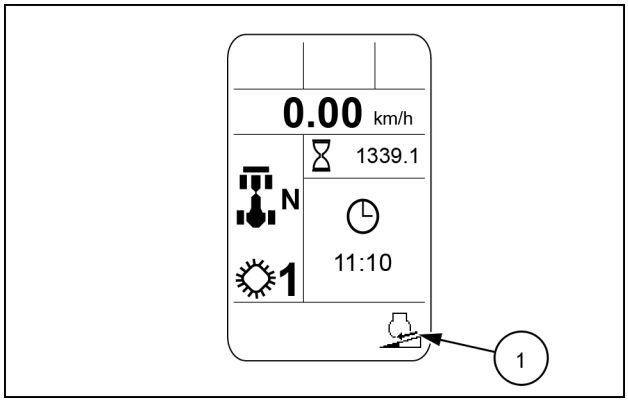
NOTE: *see "Creep Speed (optional)" – Chapter 4 in this manual for more information about the Creep Speed Memory mode.*

After Treatment status

In this section the display will show the engine derate icon.

The display will show the icon **(1)** when engine derate occurs.
Engine derate may occur in three different events:

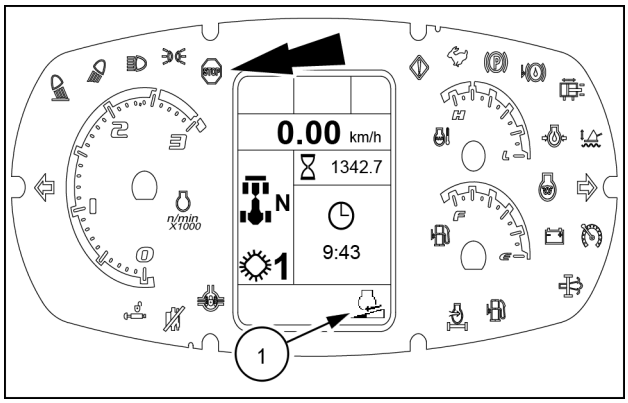
1. ATS failure moderate inducement (NON CRITICAL warning)
2. ATS failure severe inducement (CRITICAL warning)
3. ATS soot dangerous threshold (CRITICAL warning)



LEIL14CWL0100AB 9

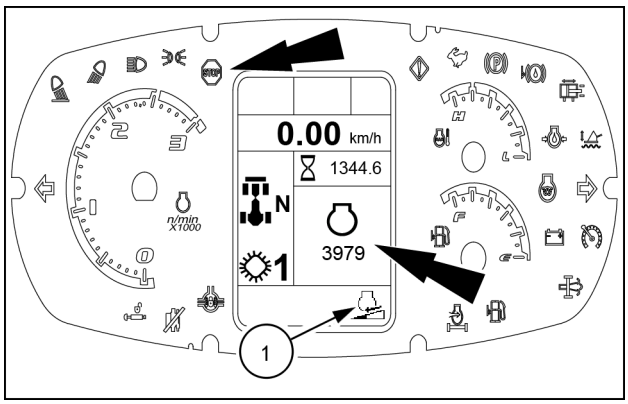
In the event of ATS failure moderate inducement, the icon **(1)** will be displayed. The amber warning lamp in the cluster will flash for 4 seconds and then it will becomes steady. The related buzzer will activate for 4 seconds (continuous tone).
This warning will be reset automatically from the DMD after 4 seconds and it will reappear on the DMD after 10 minutes, if still present.

In the event of ATS failure severe inducement, the icon **(1)** will be displayed. The red STOP lamp in the cluster will flash for 4 seconds and then it becomes steady. The related buzzer will activate for 4 seconds (continuous tone).



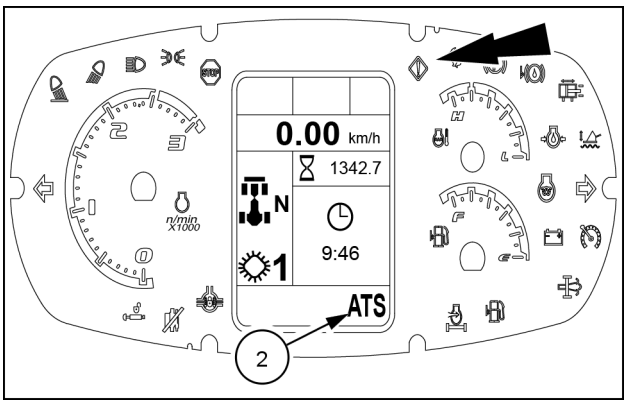
LEIL14CWL0101AB 10

In the event of ATS soot dangerous threshold, the icon **(1)** will be displayed. The red STOP lamp in the cluster will flash for 4 seconds and then it becomes steady. The related buzzer will activate for 4 seconds (continuous tone). Once this warning is activated, error code 3979 will be displayed.



LEIL14CWL0102AB 11

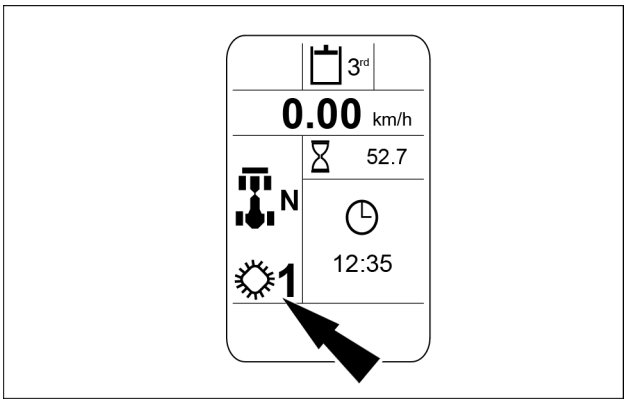
The display will show the icon **(2)** when ATS failure mild inducement occurs.
In this event, the amber warning lamp in the cluster will flash for 4 seconds and then it will becomes steady.
This warning will be reset automatically from the DMD after 4 seconds and it will reappear on the DMD after 60 minutes, if still present



LEIL14CWL0103AB 12

Transmission gear engaged

The transmission gear engaged is displayed on the left-hand section, below the vehicle travelling direction. The transmission symbol shall always be displayed.
Two transmission gears can be shown on the DMD: 1st gear or 2nd gear.

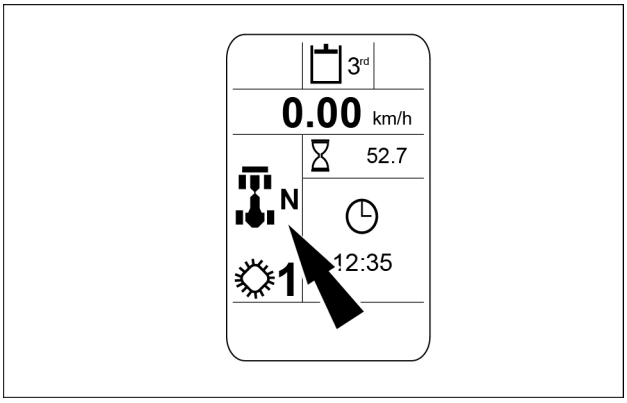


LEIL14CWL0093AA 13

Vehicle travelling directions

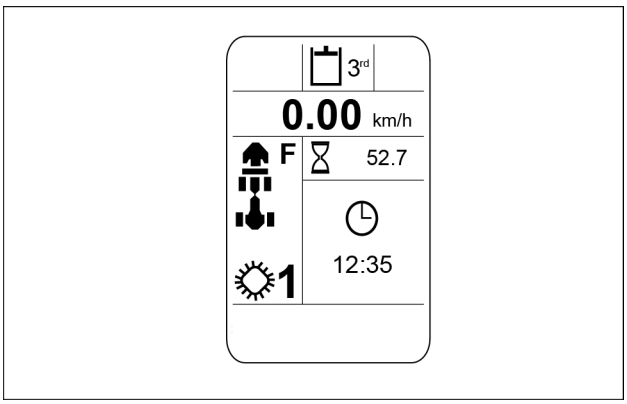
The vehicle directions section is located in the left-hand part of the DMD. Three travelling directions can be shown: FORWARD, NEUTRAL or REVERSE.
Each direction is shown by the related symbol and letter.

The “machine body” symbol and the “N” letter show that the NEUTRAL direction is engaged.



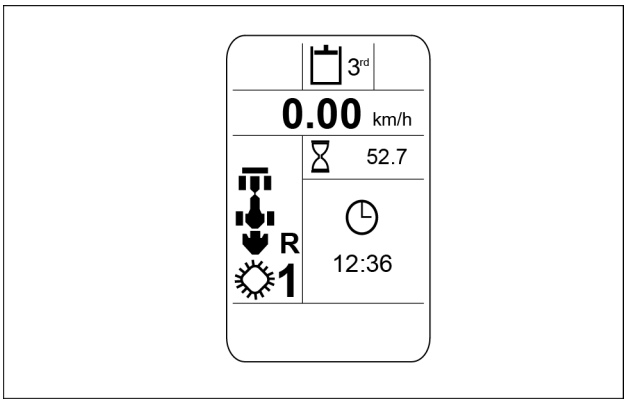
LEIL14CWL0093AA 14

FORWARD direction engaged.



LEIL14CWL0104AA 15

REVERSE direction engaged.



LEIL14CWL0105AA 16

Display set-up menu

To enter the menu of the display, use the switches described below:

A. Escape/home key - Use this key to exit and return to the driving screen. This key can be used anytime to start over and begin again or to exit a field. It can also be used to electronically check fault codes.

B. Enter/confirm key - Use this key to confirm selections: After selections have been highlighted, use the enter/confirm key to choose selections.

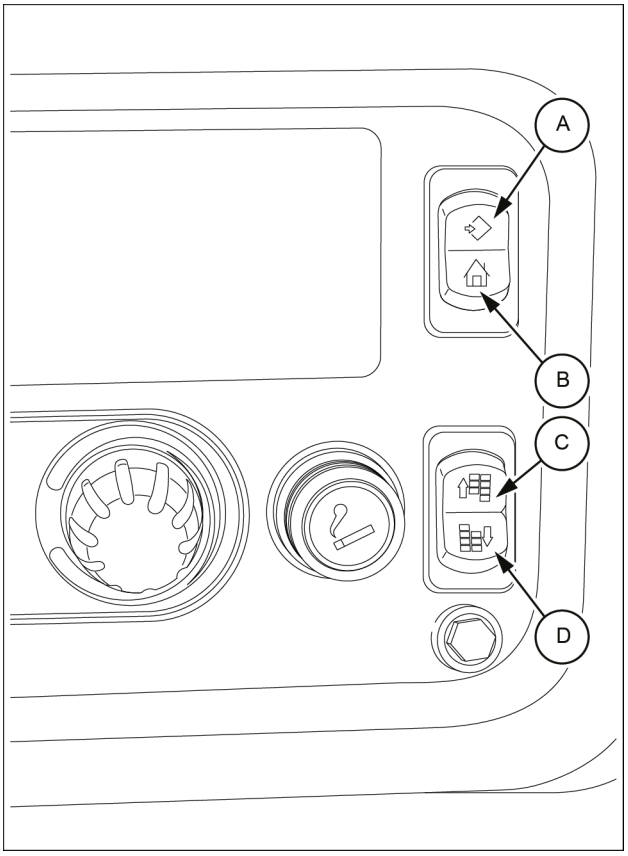
C. Up arrow key - Use this key to scroll up to selections.

D. Down arrow key - Use this key to scroll down to selections.

The “Enter” switch will let also to access the machine menu configuration page, by pushing and keeping the button pressed for more than 3 seconds in key-on conditions (only if no error codes/warnings are displayed). The following features shall be available:

1. Buzzer ON/OFF
2. Units (km/h or mph) setting
3. After Treatment
4. Engine oil reset
5. Clock setting
6. Active error codes

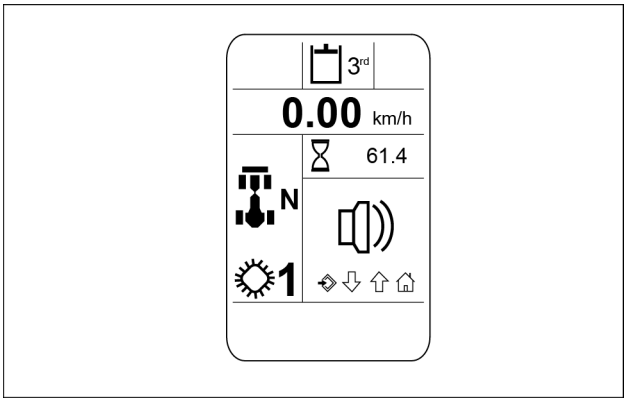
To access the menu press the key **(B)** for about **3 s**.
Use the arrow keys **(C)** or **(D)** to select the required item and press the key **(B)** to accept.



LEIL16CWL0587BB 17

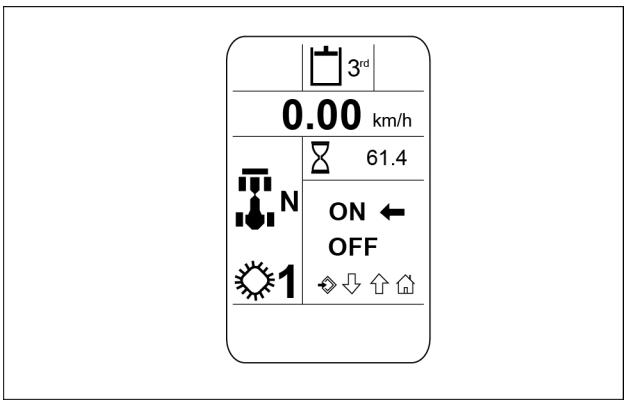
Buzzer ON/OFF

This menu shall allow the user to enable an audible feedback when one of the navigation buttons (enter, home, up and down) is pressed.



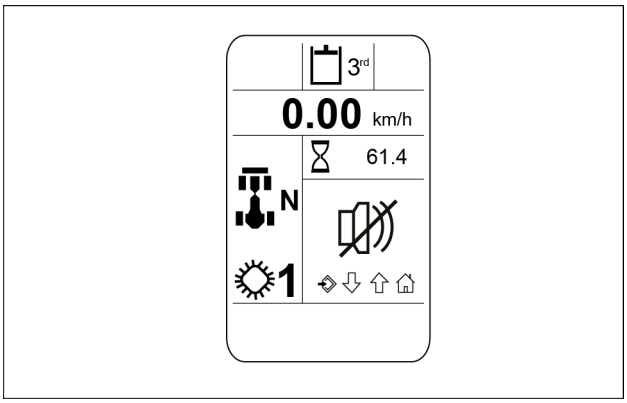
LEIL14CWL0124AA 18

Once pressed the enter key, use the arrow keys to select ON or OFF to activate or deactivate the buzzer.



LEIL14CWL0125AA 19

If the key is OFF, the navigation buttons shall not have a sound.

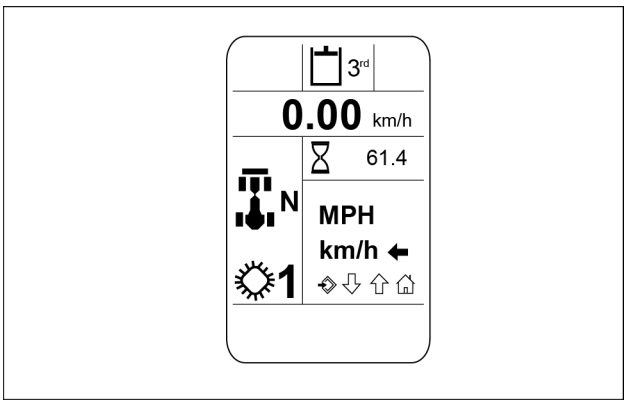


LEIL14CWL0126AA 20

Units (km/h or MPH)

This menu shall allow the user to set speed unit: km/h or mph.

Once pressed the enter key, use the arrow keys to move the selection between the two speed units.
Use the enter key to confirm the setting.
Use the home key to exit the menu.



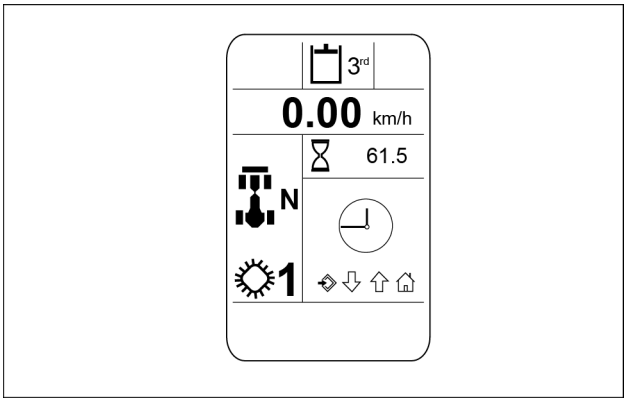
LEIL14CWL0127AA 21

Clock setting

This menu shall allow the user to set the clock value and format.

From this menu two screens can be selected:

- “SET” screen, to set the hour value;
- “12/24” screen to set the clock format.



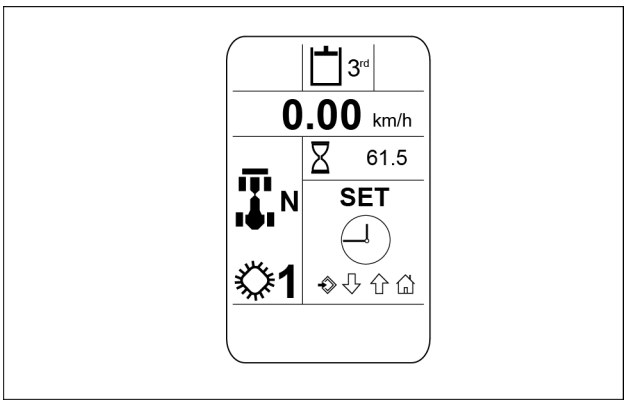
LEIL14CWL0128AA 22

If the enter key is pressed on the “SET” screen, the clock shall be visualized.
The first digit on the left–hand shall be the hours.

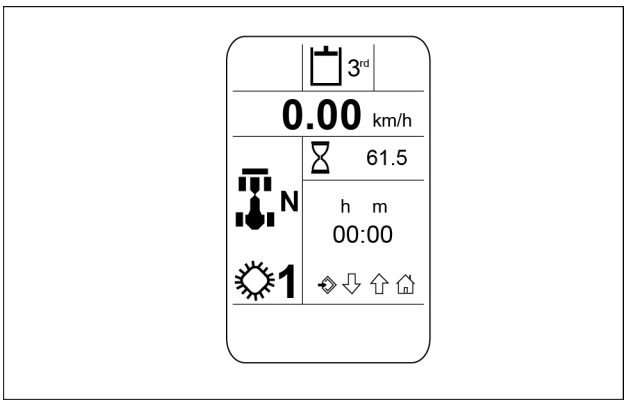
Use the up arrow key to increment the selected digit.
Use the down arrow key to move the selection rightward, to the minutes digit.

Use the enter key to confirm the selected value for the clock
Once pressed the enter key, the DMD shall go back to the “SET” screen.

Use the home key to exit the menu.
If the home key is pressed during the setting, the DMD shall go back to the set screen without saving changes.

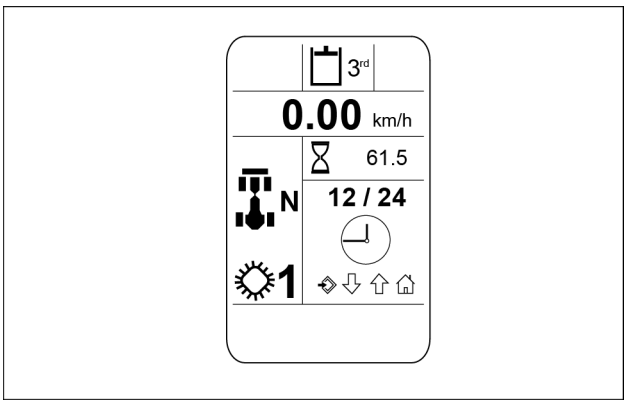


LEIL14CWL0129AA 23



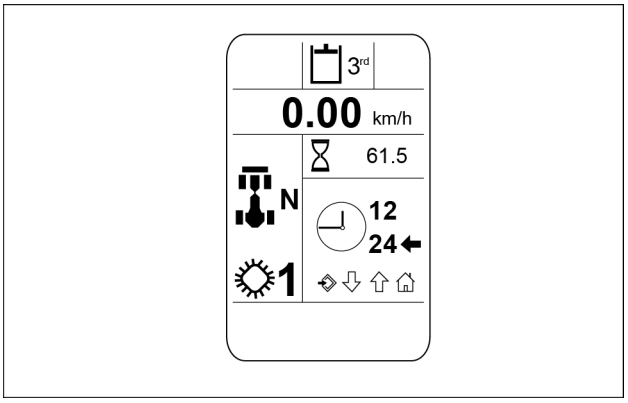
LEIL14CWL0131AA 24

Select the “12/24” screen to set the clock format.



LEIL14CWL0130AA 25

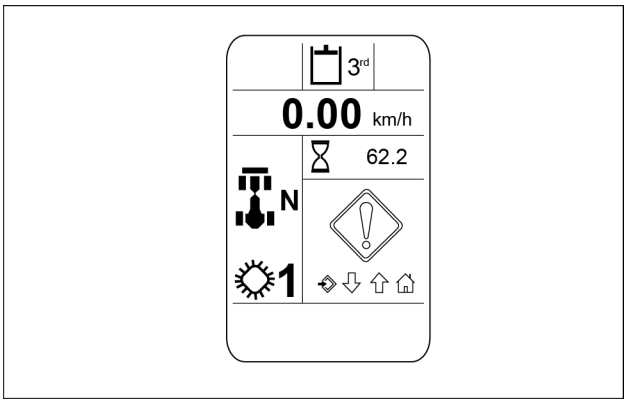
Once pressed the enter key on the “12/24” screen, the arrow shall be near to the actual saved value.
Use the arrow keys to move the selection between the two formats: 12 hours or 24 hours.
Use the enter key to confirm the setting.
Use the home key to exit the menu.



LEIL14CWL0132AA 26

Active error codes

This menu allows the operator to retrieve all active error codes.
All the error codes shall cycle until acknowledgment through the home key. Once all the error codes have been acknowledged, the system shall go back to the visualization of the clock.

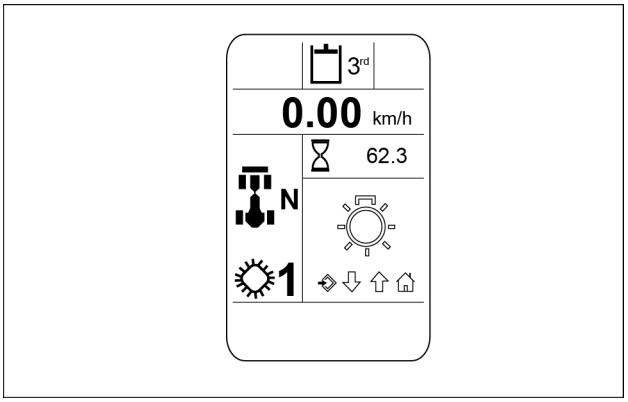


LEIL14CWL0143AA 27

Back light and dimming

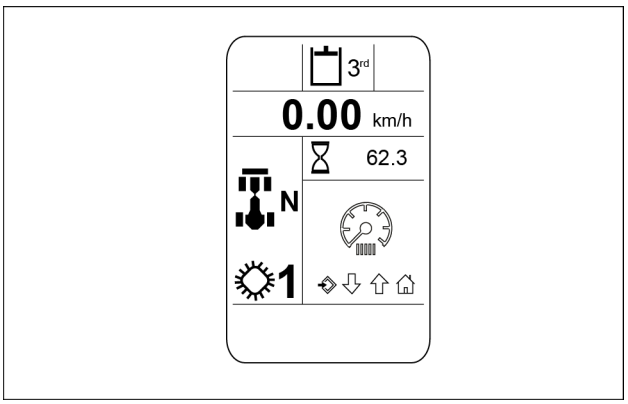
The cluster switches between day and night luminance levels using the side lights status and it is able to manage them independently using the same law.
The value is based on lamps-decal gauges lighting level.

The pressure of more than 3 seconds of the up arrow key shall allow the regulation of the backlight of gauges and lamps.



LEIL14CWL0144AA 28

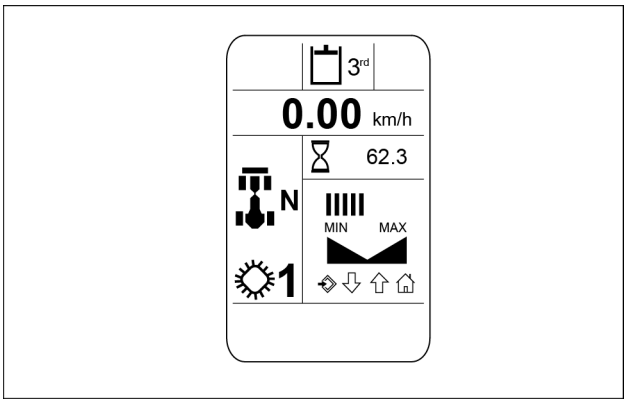
The pressure of more than 3 seconds of the down arrow key shall allow the regulation of the backlight of the display.



LEIL14CWL0145AA 29

5% of luminance corresponds to the minimum level. 100% corresponds to the maximum level.
The initial default value is 50%. This initial default value can be changed and adjusted by the operator.
The DMD and lamps backlighting shall never go to 0. All the backlighting shall go at its maximum level when the side lights are off.

During dimming, the dimming symbol shall be displayed together with the bar graph representation of luminance value in a range of 10 steps.



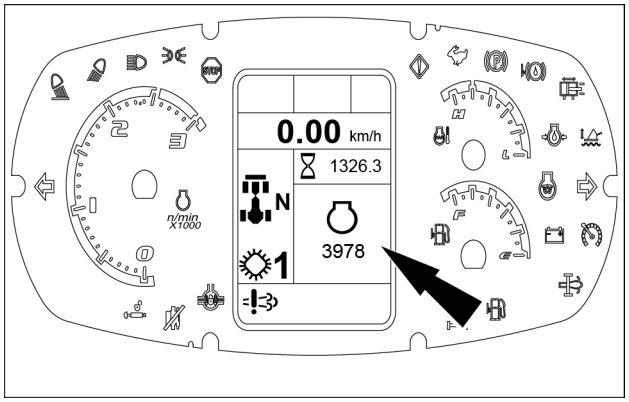
LEIL14CWL0146AA 30

Operator warning system

The instrument cluster and the display shall inform the operator about all the operating conditions of the machine which are out of range. On start up, the instrument cluster shall not take into account the fault conditions that could have been present at the shut down of the machine, and the fault detection shall start from the beginning.

Warnings

The warnings represent all those situations that could be dangerous for the machine or for the operator. When a warning occurs, the Dot Matrix Display (DMD) shall show an icon symbol that identifies the occurring problem. The warning message shall appear on the bottom part of the DMD section dedicated to the clock and to the error codes. The warnings and the error codes shown by the display are defined according to three priority levels: level 2, level 3 and level 4.

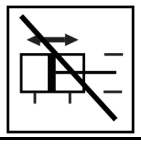


LEIL14CWL0099AA 31

Action required

The “action required” shall appear when there will be the need to inform the operator that he is trying to activate a functionality with one or more activation conditions not satisfied. In this case, the action(s) to be executed shall be shown on instrument cluster by means of dedicated icons. The “action required” shall take priority of the DMD’s section dedicated to the clock and to the error codes.
The DMD shall display an icon and the instrument cluster shall activate the proper buzzer.

The following table lists the “action required” icons shown on the DMD.

“Action required” table	
Description	DMD icon
1. Brake pedal full pressed	
2. Reduce the vehicle speed	
3. Engage the first gear	
4. Throttles to 0	
5. Set the gear in NEUTRAL	
6. Set the High Flow knob at 0	
7. Enable the Creep Speed mode	
8. Disable the float function	
9. Disable the Quick Coupler	
10. Disable the hydraulics	
11. Engage the parking brake	

The duration of the “action required” alarm shall be one second (2 pulses).

The “action required” shall be active until the condition is verified. Once the condition is verified, the “action required” icon shall be removed from the display.

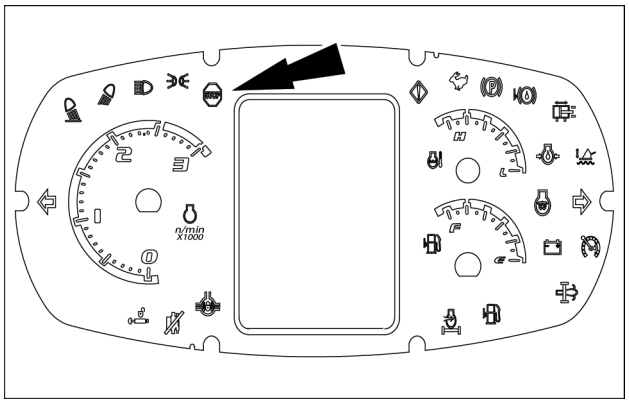
Error codes/warnings levels

When the instrument cluster detects that one of its sensors is out of order, shall generate an error code.

Level 2

The level 2 faults shall be associated with parameters that will not cause immediate damage to the machine.
When a level 2 error occurs, the red STOP lamp in the cluster will flash for 4 seconds and then it becomes steady. The related buzzer will activate for 4 seconds (continuous tone).
The error code or warning shall appear on the bottom of the section dedicated to the clock and to the error codes. The RESET button (enter/confirm key **(B)** of the keypad) shall have no effects.

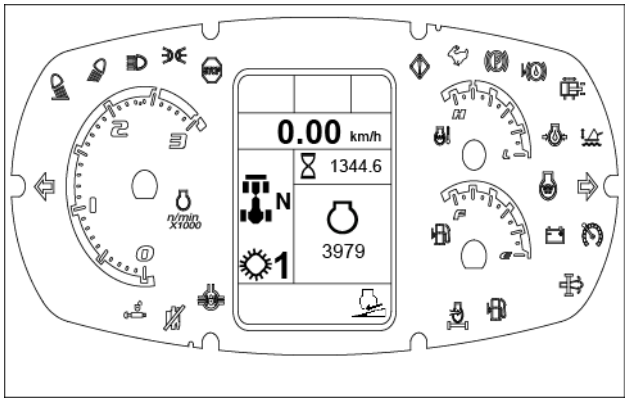
If a level 2 error code/warning occurs while programming in the set-up menu, this function shall not be aborted.
If a level 2 error code/warning is active, the access to the set-up menu shall not be allowed.



LEIL14CWL0474AA 32

Once a level 2 error code/ warning is active, only the error codes/ warnings with the same level shall be displayed through a 4-second cycling.

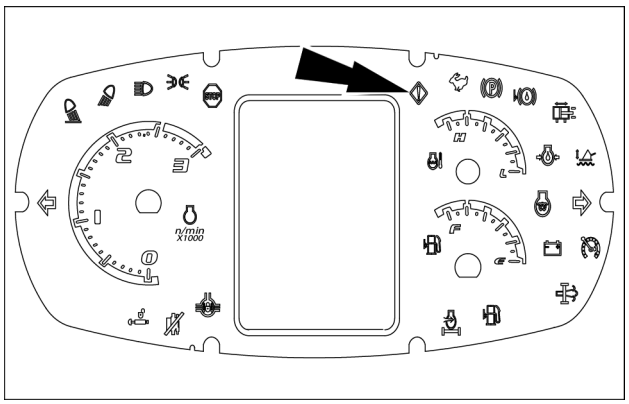
When the error code 3979 is active, the access to the set-up menu is allowed. If more level 2 error codes/warning are present together with the error code 3979, the access to the set-up menu is allowed.



LEIL14CWL0630AA 33

Level 3

Level 3 faults or warnings conditions shall be associated with parameters that will not cause immediate damage to the machine or shut the machine down but will require careful servicing.
The amber warning lamp in the cluster will flash for 4 seconds and then it will becomes steady. The related buzzer will activate for 4 seconds (continuous tone).
When the RESET button (enter/confirm key **(B)** of the keypad) is pressed, the error code/ warning shall be cleared for 10 minutes. The amber warning lamp shall stay steady until the fault is detected.



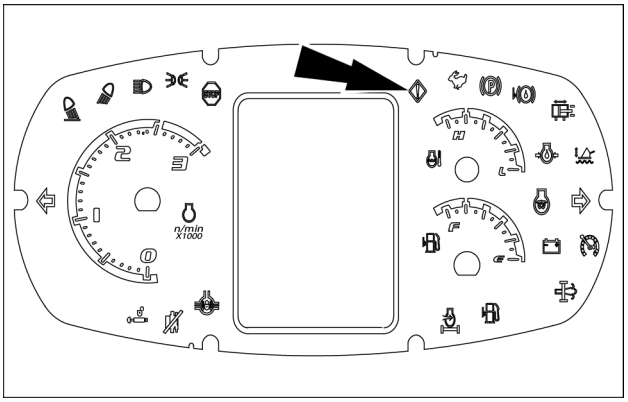
LEIL14CWL0474AA 34

If a level 3 error code/warning occurs while programming in the set-up menu, this function shall not be aborted.
If a level 3 error code/warning is displayed, the access to the set-up menu shall not be allowed till the warning clearance..

Once a level 3 error code/ warning is active, only the error codes/ warnings with the same or higher level shall be displayed through a 4-second cycling.

Level 4

Level 4 faults or warnings conditions shall be associated with parameters that will not cause immediate damage to the machine or shut the machine down but will require careful servicing.
The amber warning lamp in the cluster will flash for 4 seconds and then it will becomes steady. The buzzer shall be OFF.
When the RESET button (enter/confirm key **(B)** of the keypad) is pressed, the error code/ warning shall be cleared for 1 hour. The amber warning lamp shall stay steady until the fault is detected.



LEIL14CWL0474AA 35

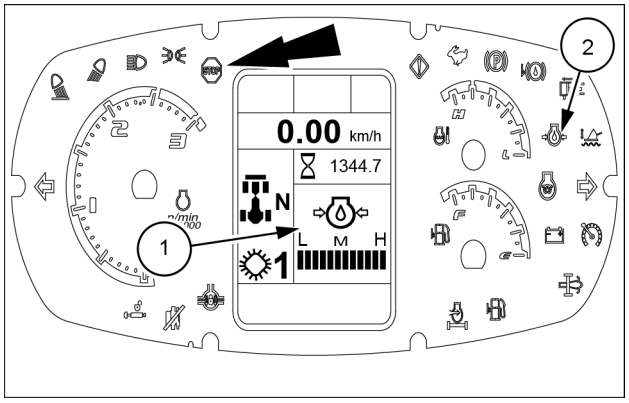
If a level 4 error code/warning occurs while programming in the set-up menu, this function shall not be aborted.
If a level 4 error code/warning is displayed, the access to the set-up menu shall not be allowed till the warning clearance..

If more level 4 error codes/ warnings are active simultaneously, they shall be displayed through a 4 second cycling.

Engine oil pressure warning

In the event of engine oil pressure too low, the icon **(1)** will be displayed and the indicator lamp **(2)** in the instrument cluster will illuminate. The red STOP lamp in the cluster will flash for 4 seconds and then it becomes steady. The related buzzer will activate for 4 seconds (continuous tone).

After cranking and engine rpm are higher than 500, this warning shall be activated only if the “engine oil pressure too low” condition is detected for more than 15 seconds.
During normal operation (engine ON), this warning shall be filtered 5 seconds on activation.
With the engine ON (rpm higher than 500) this warning shall be filtered 1 second for deactivation.

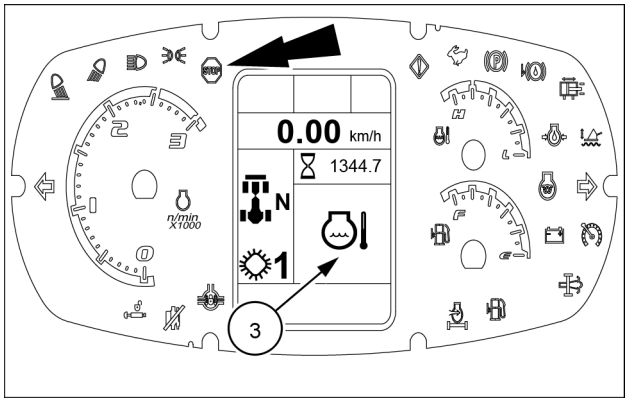


LEIL14CWL0639AB 36

Engine coolant temperature warning

In the event of engine coolant temperature too high, the icon **(3)** will be displayed. The red STOP lamp in the cluster will flash for 4 seconds and then it becomes steady. The related buzzer will activate for 4 seconds (continuous tone).

The signal name is Engine Over Temperature.
The warning threshold shall be set when Engine Over Temperature is set to value 0x1 and 0x2.
This check shall be done at engine rpm higher than 500.



LEIL14CWL0640AB 37

4 - OPERATING INSTRUCTIONS

Starting the unit

Starting the engine

⚠ WARNING

IMPROPER OPERATION OF THIS MACHINE CAN CAUSE DEATH OR SERIOUS INJURY.
MAKE SURE THAT EVERY OPERATOR:
-is instructed in the safe and proper use of this machine.
-reads and understands the operator's manual for this machine.
-reads and understands ALL safety signs on the machine.
Failure to comply could result in death or serious injury.

W0188A

Before operating the machine

Before operating this machine, complete the following procedures:

1. Check the level of all fluids (engine oil, fuel, hydraulic fluid and coolant) and make sure that the fluids and lubricants are suitable for prevailing conditions.
2. Carry out the daily maintenance operations.
3. Inspect the machine, look for any signs of possible leakage and check the hoses. Tighten or replace as necessary.
4. See Run in period of a new machine in this chapter, if the machine is new or if the engine has been re-conditioned.
5. Check the tires for any visible damage. Replace or repair as necessary. Check for correct tire air pressure and adjust pressure if necessary.
6. Clean the steps and hand holds. Grease, oil, mud, or ice in winter on the steps and access handles can cause accidents. Make sure they are kept clean at all times.
7. Clean or replace any decal which is illegible. See “Safety signs” – Chapter 2.
8. Make sure that the engine access panels and all doors are properly closed and latched.
9. Secure the cab door in either fully closed or fully opened position.
10. Remove any obstructions which hinder visibility. Clean the windshield, the windows and the rear view mirrors.
11. Check that no tools or other items have been left on the machine or in the operator's compartment.
12. Make sure no one is on or under the machine. The operator must be alone on the machine.
13. Make sure no one is standing in the machine working area.
14. Find out about current safety measures in use on the work site.
15. Work out a convenient means of escape from the machine (emergency exit via the windshield, the rear or side window glass) in the event of the cab door being jammed or the machine turning over.
16. Before undertaking any travel or working operations during hours of darkness, make sure the lighting and signaling equipment is fully operative.
17. Adjust the seat so that you can apply the foot brakes when your back is against the seat backrest.
18. Fasten and adjust the seat belt.
19. With the engine running and at operating temperature, check the instrument panel for correct indications.
20. Check the loader controls for correct operation.

Starting the engine

⚠ WARNING

Equipment failure could cause accident or injury!
Before operating the machine, check for correct operation of steering, brakes, hydraulic controls, instruments, and safety equipment. Make sure the transmission control lever is in the neutral position. Make all adjustments before operating the machine.
Failure to comply could result in death or serious injury.

W0204A

NOTE: *if the machine has been out of use for some time, see Starting up after storage in Removal – Chapter 7.*

NOTE: *if you need to start the engine using a booster battery, see Auxiliary battery connections – Chapter 7.*

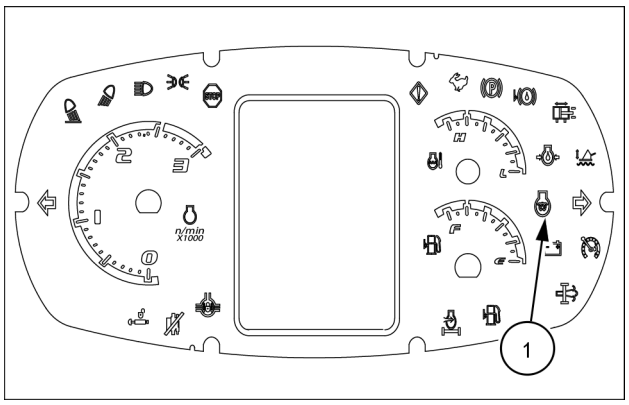
1. Turn the master disconnect switch to the ON position.
2. Take up the correct position in the operator's seat with the seat belt correctly fastened. Make sure you can push the foot pedals completely down with your back against the seat cushion.
3. Make certain the transmission direction control is in NEUTRAL and the parking brake is applied.

If one or more of the above conditions are not satisfied, cranking is not allowed when turning the key; when the key is released, the required action(s) is (are) shown on the instrument cluster display with a proper icon.

NOTE: *see "Display" – Chapter 3 for more information about the actions required.*

This machine is equipped with engine glow plug.
For the engine start or when the engine is not warmed up:

4. Keep all non-authorized personnel clear of the area. Sound the horn to alert others of your intent to start the engine.
5. Turn the key switch to the ON position and check the instrument indicators.
6. Wait for the engine glow plug indicator lamp **(1)** to go out (completion of the engine pre-heating phase).
7. Once the glow plug indicator lamp goes out, turn the key switch to the START position until the engine starts, then release the key.



LEIL14CWL0474AA 1

This allows for smooth running conditions during engine warm up.

NOTE: *the indicator lamp **(1)** may illuminate again during cranking and shortly after the engine starts for post-heating.*

NOTICE: *the starter has an automatic cut out to protect itself. In cold weather conditions, extended cranking may be necessary.*

8. After the engine starts, check the instruments to make sure the indications are correct. Run the engine at low idle with the transmission in neutral until the engine coolant temperature is warm.

NOTICE: *operate the machine at reduced loads until all systems reach operating temperature. This is very important during extremely cold weather operation to protect both the engine and hydraulic systems.*

Engine speed

DO NOT OPERATE the engine at idle speed for long periods. This can cause a low operating temperature. A low operating temperature can cause acids and deposits in the engine oil.

Run the engine at low idle for a minute at start up before picking up speed and load.

Always bring the engine to low idle for a few minutes to let all parts cool evenly before shut down.

NOTICE: *always shut the engine down from the lowest idle to prevent damage to the turbocharger.*

Operating in extreme temperatures

Operating in hot climate conditions

1. Keep the coolant at the correct level in the coolant reservoir and in the radiator.
2. Use the correct solution of ethylene glycol and water in the cooling system.
3. Check the cooling system cap before hot weather starts. Replace the cap as required. Replace with a genuine replacement part to insure the correct PSI rated cap.
4. Clean all dirt and debris from the radiator, cooler, and engine area.
5. Check the condition of the engine accessory drive belt.
6. Use lubricants of the correct viscosity. See “Fluids and lubricants” – Chapter 7.

Operating in cold climate conditions

⚠ WARNING

Hazard to bystanders!
Make sure the area surrounding the machine is clear of all persons before starting the engine.
Failure to comply could result in death or serious injury.

W0090A

⚠ WARNING

Equipment failure could cause accident or injury!
Before operating the machine, check for correct operation of steering, brakes, hydraulic controls, instruments, and safety equipment. Make sure the transmission control lever is in the neutral position.
Make all adjustments before operating the machine.
Failure to comply could result in death or serious injury.

W0204A

Cold weather conditions require special operating procedures. During these conditions your machine will require special start up, warm up and maintenance procedures for the best performance. Proper cold weather maintenance will extend the service life of your machine.

Batteries

Clean the batteries and make sure they are at full charge. In cold conditions it is important to run the machine long enough to return the charge lost by starting. In most cold conditions this is about ten minutes, but in extreme cold it can be 30 minutes.

***NOTE:** a fully charged battery at **-17 °C** (**1.4 °F**) has only **40%** of the normal starting power. At **-29 °C** (**-20.2 °F**) the battery has only **18%**.*

Inspect the battery cables and terminals. Clean the terminals and apply electrical terminal sealers to prevent corrosion. See your dealer.

Lubricants

Follow the recommended oil and filter service for the engine and hydraulic system as shown in this manual. Use the correct viscosity oil in each component for the ambient temperatures the machine is operating in. For extreme cold conditions, contact your dealer for alternative lubricants for the hydraulic and transmission systems.

Fuel

Check with your fuel supplier for the correct cold weather fuel. Engine power will be reduced if wax particles are in the fuel filters. Some cold weather fuel blends result in lower engine power.

Check for water in the fuel system. Cold temperatures can cause condensation to form in the fuel tank. Check and drain the fuel prefilter and fuel tank for water as required.

Cooling system

Check the coolant mixture before operating in cold temperatures. A mixture of **50%** ethylene glycol and **50%** water must be used. This mixture is used if the lowest ambient temperature is **-37 °C** (**-34 °F**). If the ambient temperature is lower, adjust the mixture. It is recommended that ethylene glycol and water be used in the machine all year long.

Cold start

⚠ WARNING

Explosion hazard!
DO NOT use ether starting fluid. Serious engine damage, explosion, death, or serious personal injury could occur.
Failure to comply could result in death or serious injury.

W0148A

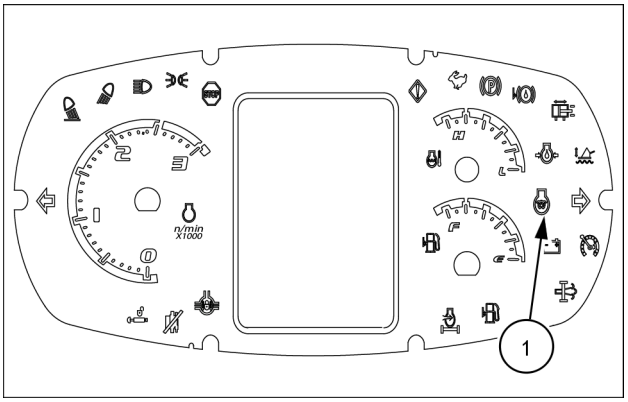
This machine is equipped with engine glow plug.
For the cold start in cold climate or when the engine is not warmed up:

1. Turn the starter key to ON.
2. Wait for the engine glow plug indicator lamp **(1)** to go out (completion of the engine pre-heating phase).
3. Once the glow plug indicator lamp goes out, turn the starter key to the START position. Operate the starter motor until the engine starts

This allows for smooth running conditions during cold weather warm up. Contact your dealer for additional cold weather starting aids.

NOTE: *the indicator lamp **(1)** may illuminate again during cranking and shortly after the engine starts for post-heating.*

NOTE: *during cold start at **-23 °C** (**-9 °F**) with 80% battery charge, the voltage to the engine control unit supply must be at least **7.5 V**. If the voltage is under this threshold, the control unit is reset and the engine does not start.*



LEIL14CWL0474AA 1

Machine warm up

During this period:

- Once the engine has started, run the engine at about half throttle (**1100 RPM** to **1300 RPM**) for a minimum of four minutes under no load. This will help stabilize the engine.
- After engine warm up, place the lift arm into float and the bucket into roll back to load the engine in order to heat the hydraulic oil. Hold for approximately two minutes. Apply and hold the foot brake, cycle the lift arm and bucket. Repeat the float/roll back heating procedure again for approximately two minutes. Raise the lift arm enough to steer the unit full left and right to warm the oil in the steering cylinders. In extreme cold conditions, hold the float/roll back condition for five minutes maximum.
- Even with the correct oil in the hydraulic/brake system, the first few times the brakes are actuated there may be some delay before the brakes are applied. The operator must actuate the brake pedal a minimum of 8 to 10 times before the machine is moved to obtain proper heating. Actuating and releasing the brakes should occur in a cycle of 3 seconds full on and 3 seconds off to obtain exchange of the brake oil.
- In extreme cold weather conditions, the brake response can be slow. The use of correct oil in the hydraulic/brake system is required in persistently severe applications. Contact your dealer for the correct oil.
- When the machine has been correctly warmed up, apply the foot brake and hold, shift the transmission to forward, disengage the parking brake and release the foot brake. Operate the machine in a clear safe area. Check the full operation of the machine.

NOTICE: *DO NOT operate the machine on the road until the transmission oil and axle oil have been correctly warmed up. Operate the machine in a clear safe area before road operation at low speed only.*

- If the machine has been left idling in cold temperature, the engine will stay warm, but the hydraulic/brake oil and the axle oil will not stay warm. The oil and components can become cold and slow brake function response time. If this should happen you MUST go through the complete warm up procedure.

Stopping the unit

Stopping the engine

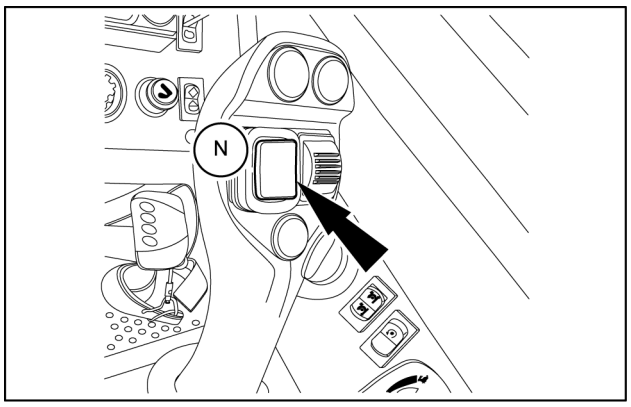
⚠ WARNING

Unexpected movement!
Always engage the parking brake and switch off the engine before exiting the machine.
Failure to comply could result in death or serious injury.

W0209A

1. Stop the machine on hard, level ground and place the switch of direction shift in NEUTRAL.

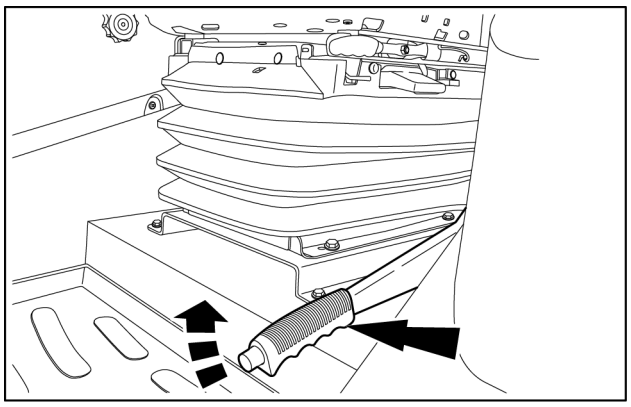
NOTICE: *if you must temporarily park the machine on a hillside, put the front of the machine toward the bottom of the hill. Make sure the machine is behind an object that will not move.*



LEIL14CWL0001AB 1

2. Slowly move the joystick forwards to rest the bucket on the ground.

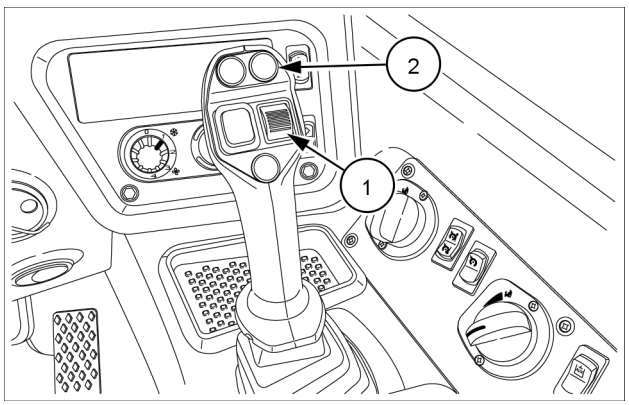
3. Pull the parking brake lever upward to apply the parking brake.
   Turn the engine off.



LEIL14CWL0002AB 2

4. Slowly move the joystick through all rotations three or four times to insure that residual pressure in the hydraulic system are released.

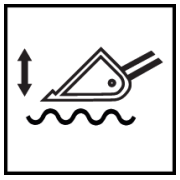
5. To release the pressure of the 3rd hydraulic function, move the roller **(1)** of the joystick forward and backward two or three times.
   To release the pressure of the 4th hydraulic function (if present), press and hold the switch **(2)** to switch from the 3rd to the 4th hydraulic function, then move forward and backward the roller **(1)** two or three times.



LEIL14CWL0084AA 3

Moving the unit

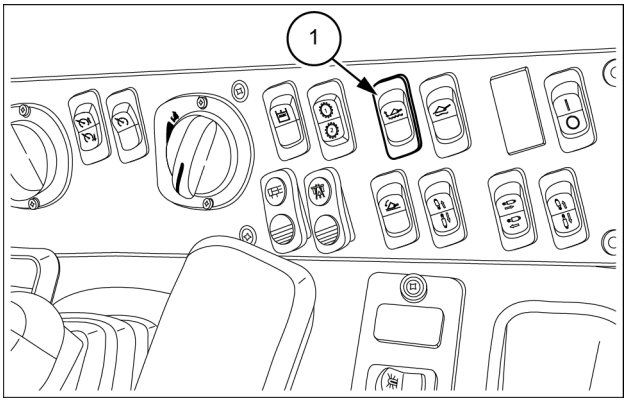
Ride control (optional)



Ride control is an optional feature that increases the ride comfort of the Compact Wheel Loader over all types of terrain with either an empty or loaded bucket. It allows faster speeds during operation, resulting in increased productivity and operator comfort. It will also reduce shock loads to the Compact Wheel Loader for reduced tire flex, structural fatigue and vibration, resulting in longer component life and reduced costs. Ride control will reduce fore and aft pitching motion during travel to allow faster speeds in load and carry applications.

To turn the Ride control ON, press the top of the Ride control switch **(1)** located in the right-hand side console.

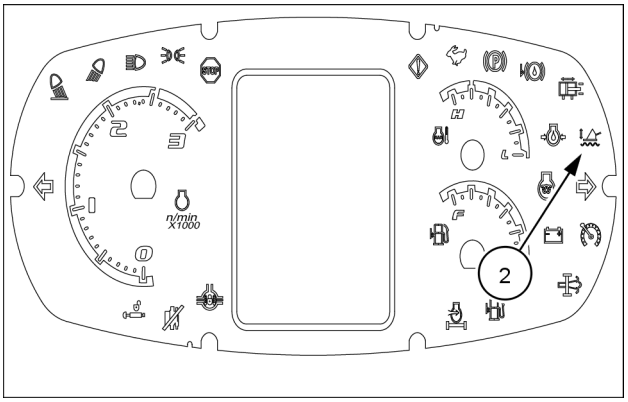
To turn the Ride control OFF, press the bottom of the switch **(1)**.



LEIL15CWL0068AB 1

With Ride control active, the green indicator lamp **(2)** in the instrument cluster will illuminate anytime the machine is traveling faster than **4 km/h** (**2.5 mph**) indicating that the Ride control is functioning.
Ride control will disengage automatically at slower speeds for loading and unloading and the indicator lamp **(2)** will flash continuously.
Ride control can be left ON at all times, whether loading or roading.

NOTE: *Ride control must be OFF when the bucket is used in fine grading operations or when precision placement of a load suspended from the bucket or other attachment is required.*

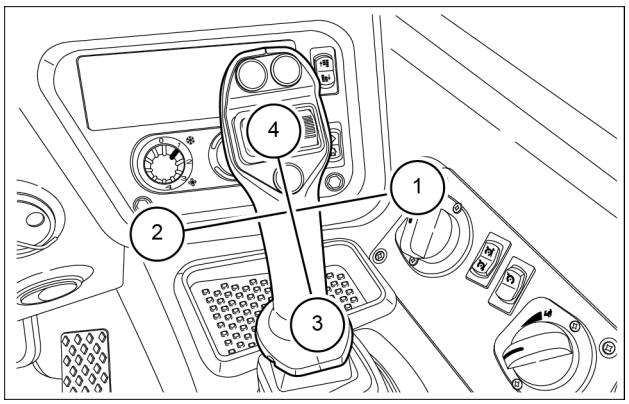


LEIL14CWL0112AA 2

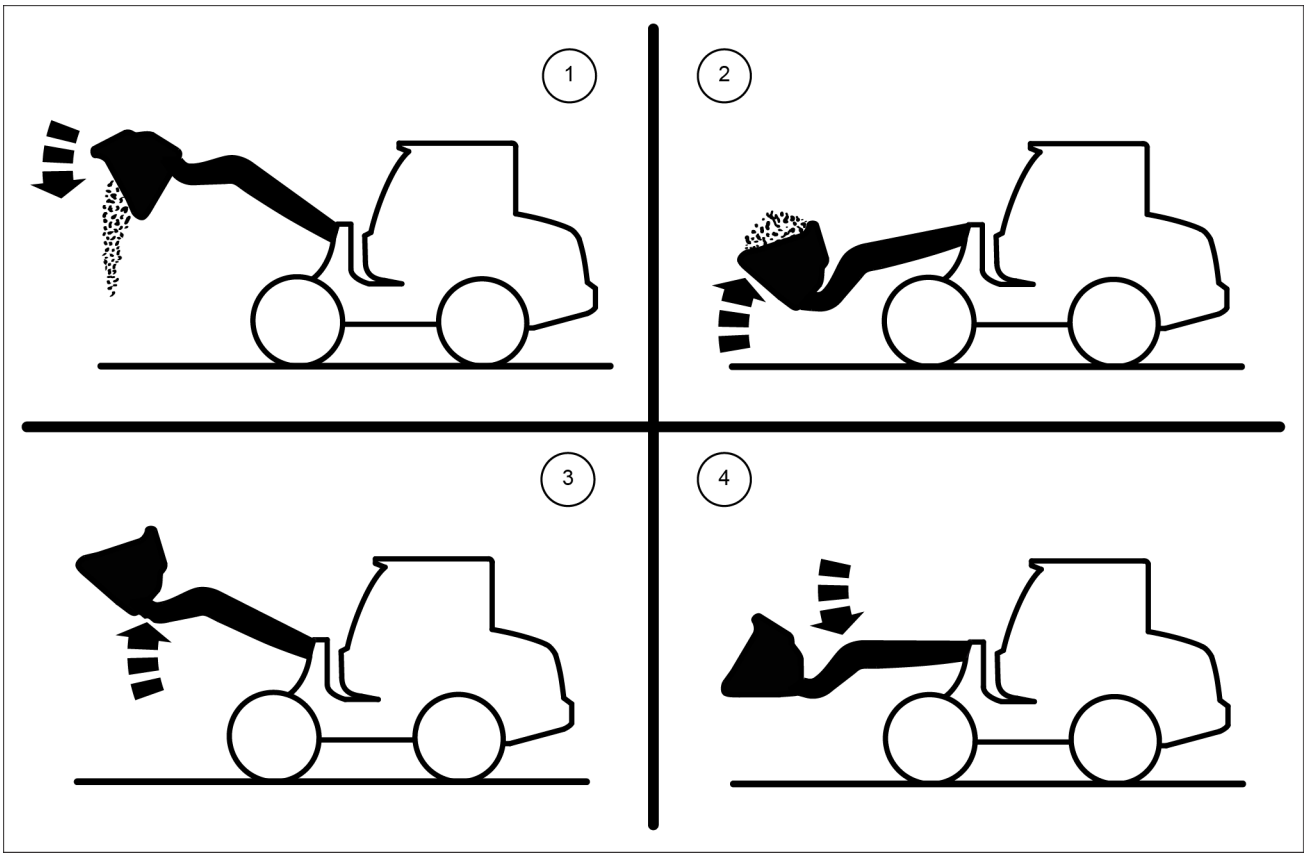
Joystick - Control lever

NOTE: *this page shows the basic loader control lever positions.*

See Loader functions switches in loader functions - CHAPTER 4 for return-to-dig and float switches.



LEIL15CWL0065AB 1



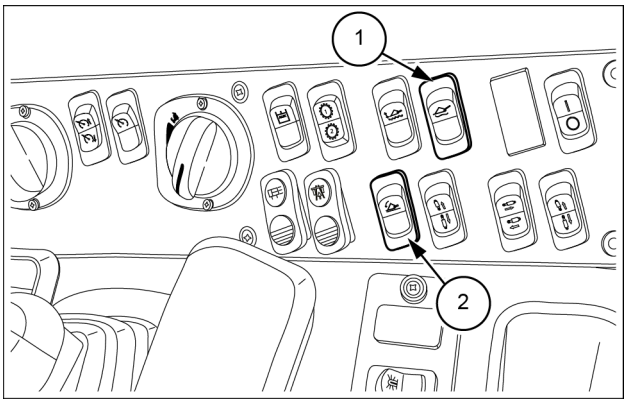
LEIL13CWL0025FB 2

1. Dump bucket
2. Rollback bucket
3. Raise lift arm
4. Lower lift arm

Loader functions

Loader functions switches

Push on the top of the switch to engage all detents.
Push on the bottom of the switch for OFF.



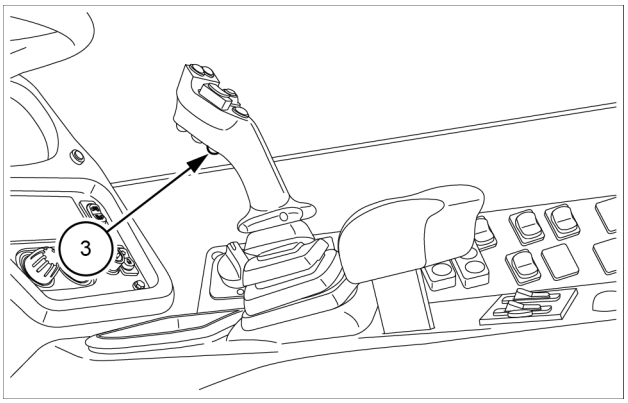
LEIL15CWL0066AB 1

1. Float switch
2. Return-to-dig switch

Return-to-dig (optional)

The Return-to-dig function is used to automatically return the bucket to the dig position after the bucket has been dumped.
To enable the Return-to-dig function press the top of the switch **(2)**.

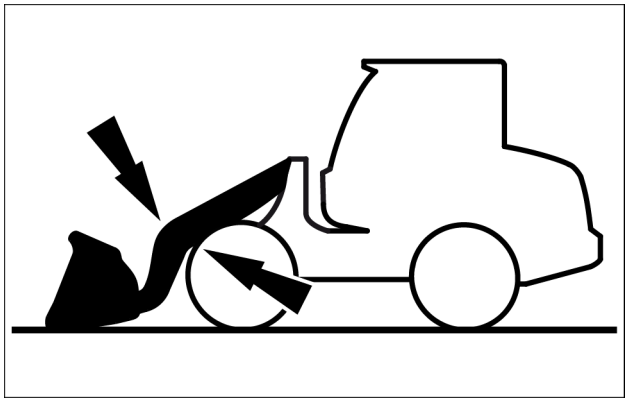
To actuate, move the joystick into the ROLLBACK position and press the button **(3)**. Then release the button **(3)** first and then the joystick, the bucket will return to the dig position.



LEIL14CWL0150AB 2

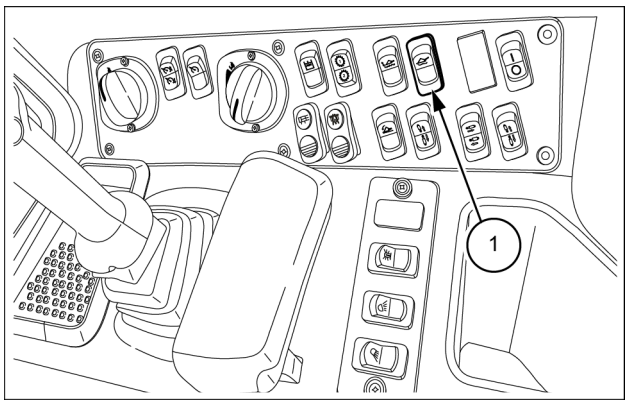
Float

The float function is used to let the loader bucket float across rough ground.



LEIL13CWL0021AB 3

To enable this function push on the top of the FLOAT switch **(1)** in the right-hand side console.

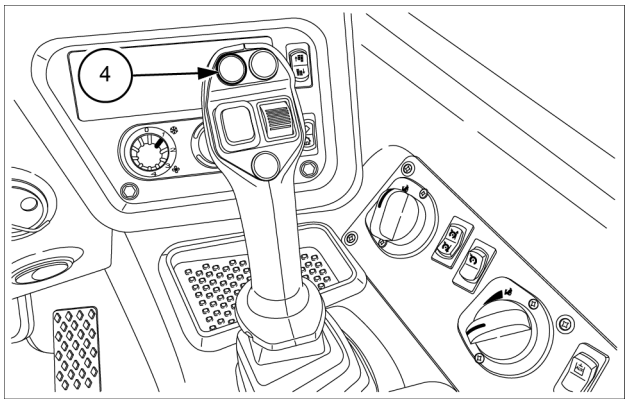


LEIL15CWL0067AB 4

To actuate, move forward the joystick in the LOWERING position and press the button **(4)** on the joystick.
Then release the button **(4)** and the joystick, the lifting arm will lower by themselves until the bucket reaches the ground.

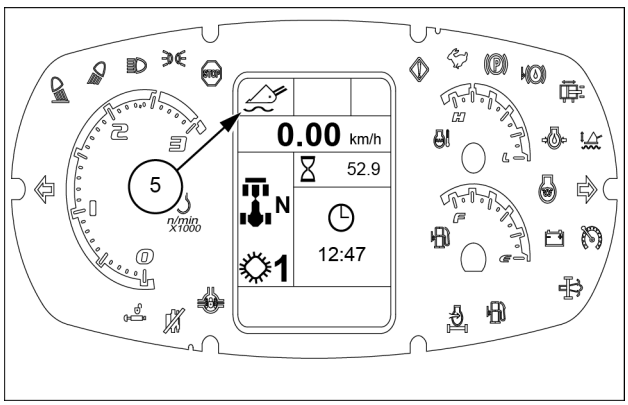
To deactivate the float function, push on the bottom of the switch **(1)**.

The float function can be deactivated also when the joystick is moved backward in the RAISING position.



LEIL14CWL0082AB 5

When the float function is activated, the display in the instrument cluster will show the icon **(5)**.



LEIL14CWL0401AB 6

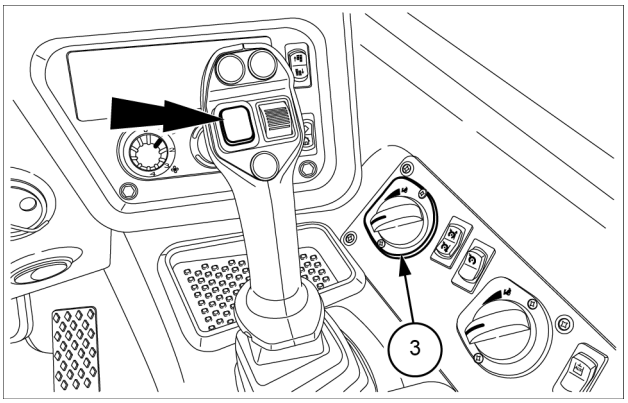
NOTICE: *when the float function has to be activated, Ride control must be disabled.*

Creep Speed (optional)

The Creep Speed mode uncouples the vehicle speed from the hydraulic power. The Creep Speed mode is useful for the operations which require low vehicle speed at high attachment hydraulic power.
The necessary conditions for the activation of the Creep Speed mode are the following:

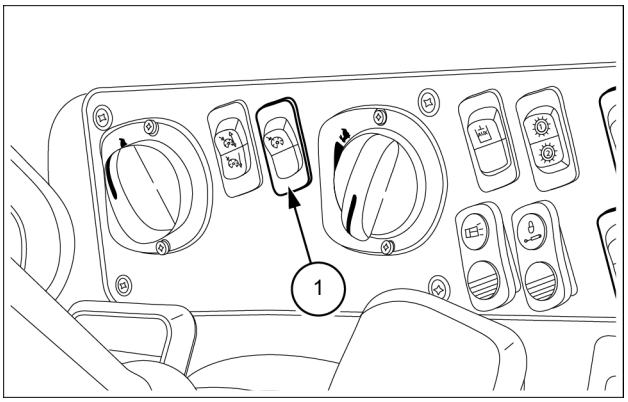
- Transmission in NEUTRAL
- 1st gear engaged
- Throttle pedal released
- Hand rpm knob **(3)** turned to the minimum position.

If one or more of the above conditions are not satisfied, when the operator tries to activate the Creep Speed, the actions required are shown on the display by means of the dedicated icons.



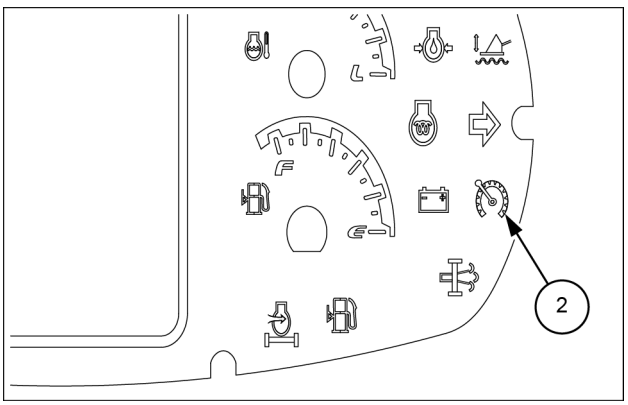
LEIL14CWL0149AB 1

When all the above conditions are satisfied, the LED on the switch **(1)** is illuminated. In this case the operator can activate the Creep Speed by pressing the switch **(1)** in ON position.



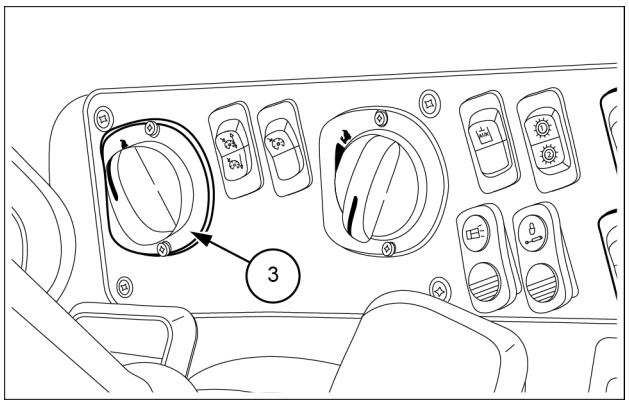
LEIL13CWL0012AB 2

When the switch **(1)** is pressed, the indicator lamp **(2)** in the cluster is illuminated: it indicates the activation of the Creep Speed mode.



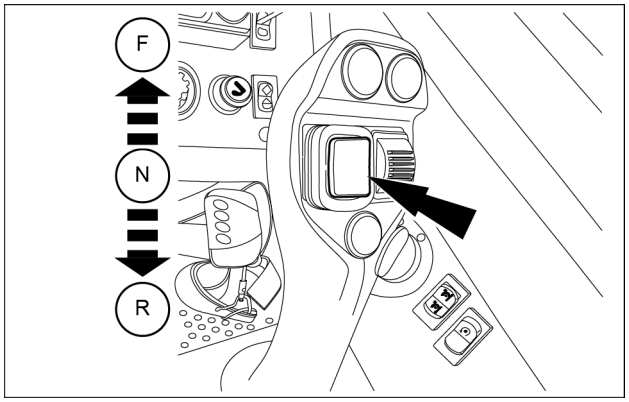
LEIL13CWL0013AB 3

Use the knob **(3)** to set the engine speed (rpm).
The vehicle speed is controlled now by the throttle pedal which now operates on the pump displacement and not on the engine rpm.



LEIL13CWL0014AB 4

Press the switch of the direction shift to set the travel direction of the machine.



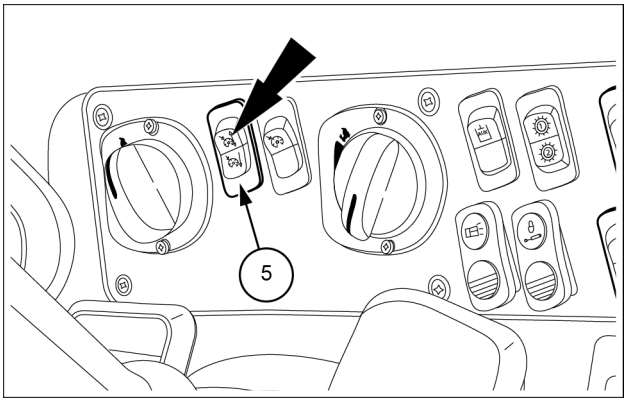
LEIL14CWL0085AB 5

NOTE: *if the Creep Speed mode is active, the 2nd gear cannot be engaged.*

NOTE: *turtle and rabbit are both allowed in the Creep Speed mode.*

Creep Speed Memory mode

While the machine travels in the Creep Speed mode with engaged direction set to FORWARD or REVERSE, the switch **(5)** can be pressed to “memorize” the current vehicle speed. Once pressed the switch **(5)** to “memorize” the vehicle speed (the switch **(5)** must be pressed on the top "+" position), the indicator lamp **(2)** flashes continuously, it indicates the activation of the Creep Speed Memory mode and the speed setpoint is shown on the display in the clock section (instead of clock indication) for some seconds.
In this mode the vehicle speed is set and fixed to the “memorized” value and the throttle pedal is no longer necessary to control the vehicle speed.



LEIL13CWL0016AB 6

While the machine travels in the Creep Speed Memory mode, the switch **(5)** can be pressed to adjust the speed setpoint to the desired speed value.

The speed is increased when "+" position is pressed; the speed is decreased when "-" position is pressed. When “+” or “-” are kept pushed, the speed increases or decreases proportionally to the pressure time; when “+” or “-” are pressed and immediately released, the speed increases or decreases by **0.1 km/h** (**0.06 mph**) per step. For each setpoint change, the new speed setpoint value is shown on the display (clock section) for some seconds.

To deactivate the Creep Speed Memory mode and to switch back to the normal Creep Speed mode, two options are possible:

- Press the brake pedal
- Press the direction shift switch to put the transmission from FORWARD or REVERSE to NEUTRAL.

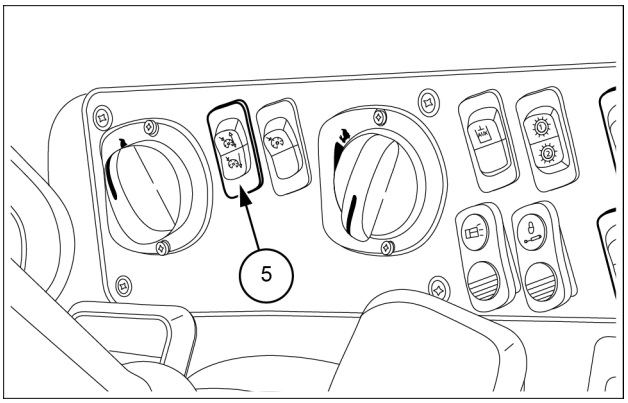
It is possible to resume the vehicle speed set point previously stored after braking or switching the F-N-R to NEUTRAL.

To set again the previously “memorized” speed:

- Press the direction shift switch to put the transmission in FORWARD or REVERSE and release the brake pedal
- Press the lower side of switch **(5)** for 3 seconds and release.

In this case the recalled speed setpoint is shown on the display in the clock section for some seconds; when the operator releases the switch, the recalled value is set.

Both turtle and rabbit can be used in the Creep Speed Memory mode. The maximum speed setpoint depends on the engaged mode (turtle or rabbit) and is **5 km/h** (**3.1 mph**) in case of turtle, **20 km/h** (**12.4 mph**) in case of rabbit.



LEIL13CWL0016AB 7

High Speed (optional)

The 221F and 321F “High Speed” models are designed to travel at a maximum speed of **35 km/h** (**21.7 mph**). If this speed is exceeded, the machine can be damaged.

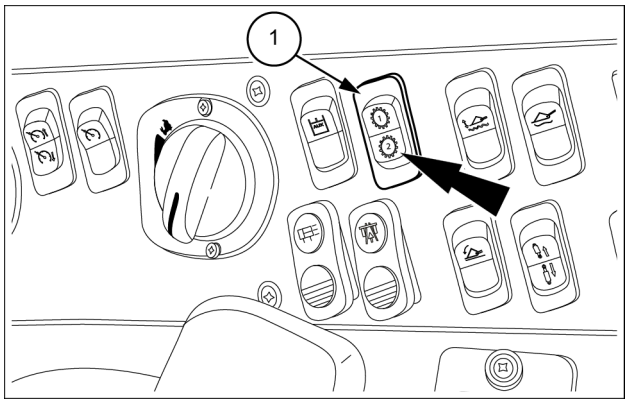
If the machine reaches a speed higher than **35 km/h** (**21.7 mph**), release the accelerator to reduce the speed. During downhill travel, press the brake pedal to brake the machine and to bring the speed into the admissable speed.

High Speed engagement

Stop the machine, press the brake pedal and put the transmission in NEUTRAL until the LED switch **(1)** in the dashboard of the right-hand side console turns on. If the transmission is in the first gear, the switch of the second (2nd) gear turns on if the above needed conditions are satisfied. Otherwise, if the transmission is in the second gear, the switch of the first (1st) gear turns on.

NOTE: *always press the brake pedal and put the transmission in NEUTRAL to shift the gear.*

If one or more of the above conditions are not satisfied, the required actions are shown on the display by means of dedicated icons.

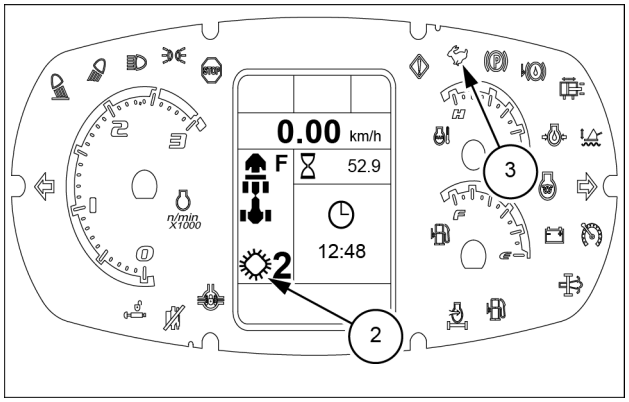


LEIL15CWL0075AB 1

Press the switch **(1)** on the "2" position and the symbol **(2)** in the display will be shown.
The symbol **(2)** shows the selected gear.
The green indicator lamp **(3)** in the cluster will turn on, as well: it indicates that the High Speed mode is active.

When the transmission shifts from the 1st to the 2nd gear, the symbol **(2)** will be displayed and the indicator lamp **(3)** will turn on. Instead, when the transmission shifts from the 2nd to the 1st gear, the symbol **(2)** will be displayed and the indicator lamp **(3)** will be OFF.

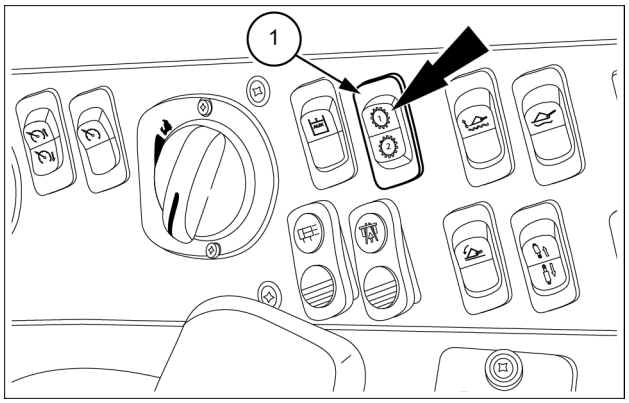
When the High Speed is engaged, only the “rabbit” mode is allowed.



LEIL14CWL0402AB 2

High Speed disengagement

Press and hold the brake pedal to slow down and to stop the machine. Put the transmission in NEUTRAL. Press the switch **(1)** on the "1" position to disengage the High Speed function.
Release the brake pedal, press the direction shift switch to set the travel direction on FORWARD and accelerate slowly to move the machine at slow speed.



LEIL15CWL0075AB 3

High Flow (optional)

The High Flow is a function necessary when the machine works with particular tools or attachments which require low vehicle speed and high hydraulic power.
The High Flow supplies an additional flow to the particular tool or attachment installed on the hydraulic coupler. The High Flow function is allowed only in the Creep Speed mode.
To activate the High Flow, follow the procedure below.

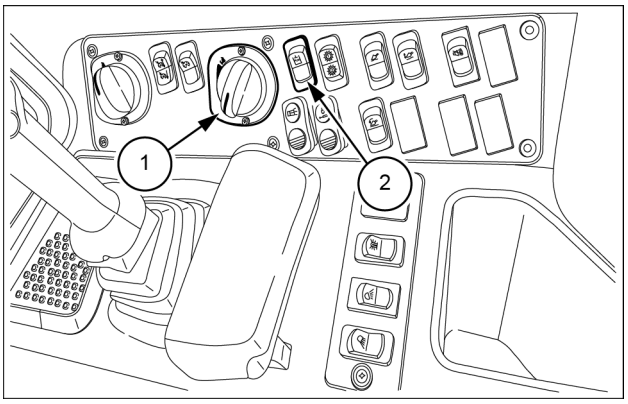
1. Activate the Creep Speed mode or Creep speed Memory mode.

NOTE: *see "Creep Speed" – Chapter 4 for information about the Creep Speed and the Creep speed mode activation.*

2. Locate the High Flow knob **(1)** and the switch **(2)** in the dashboard in the right-hand side console.
   .Turn the High Flow knob **(1)** to the minimum position and press the top symbol face of the switch **(2)**.

3. Use the High Flow knob **(1)** to adjust and increase the flow to the attachment installed on the coupler. The flow will increase proportionally to the position of the High Flow knob **(1)**.

If one or more of the activation conditions are not satisfied, the action required shall be shown on display by means of a proper icon.



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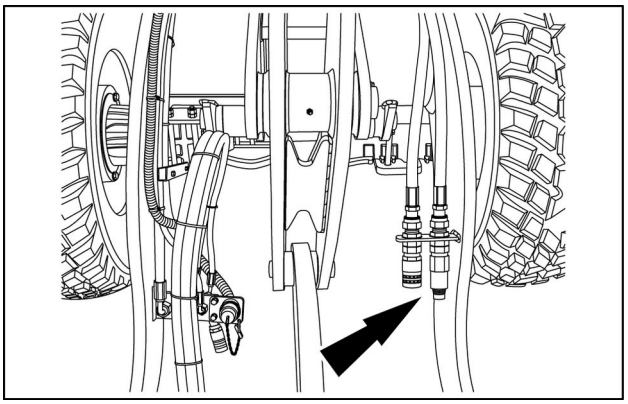
To deactivate the High Flow function, press the bottom of the switch **(2)**.

The figure beside shows the hydraulic connections for the High Flow.


LEIL15CWL0099AA 2

Differential lock (optional)

NOTICE: *never use the differential lock during road travel.*

The differential lock gives equal power to both rear and front wheels.

It is particularly useful when the wheels have insufficient grip, as in the two following cases.

When the machine is stuck

⚠ WARNING

Loss of control hazard!
Never use the differential lock at speeds above 5.0 km/h (3.1 mph) or at any time when turning the machine.
Failure to comply could result in death or serious injury.

W1354A

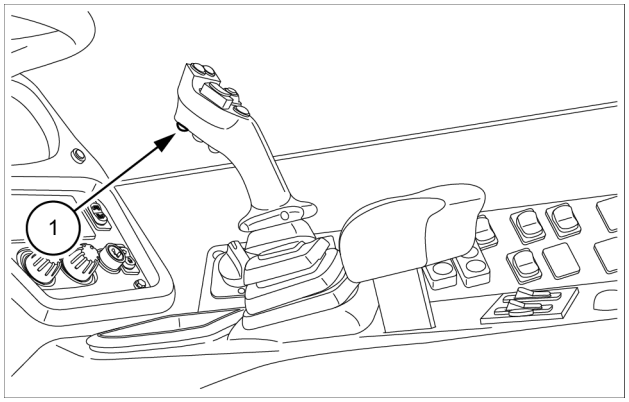
Make sure the wheels are not turning.

Press the differential lock button **(1)** to engage the differential lock.

Use the throttle pedal to increase the engine speed and then release the differential lock button **(1)**.

NOTE: *the differential is automatically released when the locking system is disengaged, when the wheel grip returns to normal, with no wheel slip.*

If the activation condition is not satisfied, the action required shall be shown on the display by means of a proper icon.



LEIL14CWL0083AB 1

Before crossing a soft or muddy area

⚠ WARNING

Loss of control hazard!
Never use the differential lock at speeds above 5.0 km/h (3.1 mph) or at any time when turning the machine.
Failure to comply could result in death or serious injury.

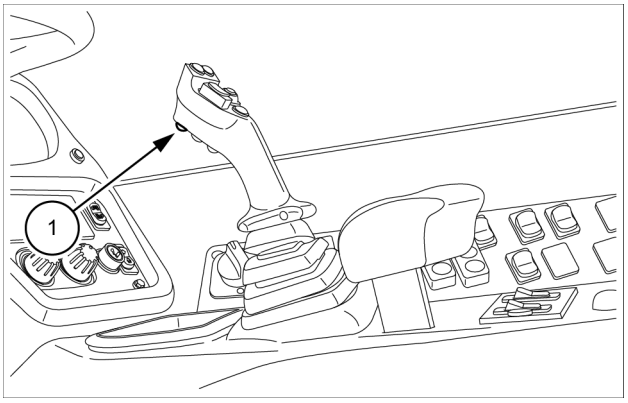
W1354A

Make sure that the machine is moving in a straight line and that both wheels are turning at the same speed.

Press the differential lock button **(1)** to engage the differential lock.

After the machine has moved through the area, release the differential lock button **(1)**.

NOTE: *the axles can be damaged if the operator tries to engage the differential lock when the machine is turning or if one of the wheels of each axle is turning faster than the other one.*



LEIL14CWL0083AB 2

5 - TRANSPORT OPERATIONS

Road transport

Safety rules

⚠ WARNING

Crushing hazard!
Engage the safety lock link before service or transport.
Failure to comply could result in death or serious injury.

W1154A

⚠ DANGER

Unexpected movement!
Make sure parking brake is applied. Secure machine with wheel chocks.
Failure to comply will result in death or serious injury.

D0013A

⚠ WARNING

Driving hazard!
Know all rules, regulations, laws, and required safety equipment for transporting or operating this machine on a road or highway. See your dealer to obtain a rotating beacon, backup alarm, Slow Moving Vehicle (SMV) emblem, and other safety equipment.
Failure to comply could result in death or serious injury.

W0154A

⚠ WARNING

Transport hazard!
The machine can slip or fall from a ramp or trailer. Make sure the ramp and trailer are not slippery. Remove all oil, grease, ice, etc. Move the machine on or off the trailer with machine centered on the trailer or ramp.
Failure to comply could result in death or serious injury.

W0152A

Make sure you know the safety rules and regulations before transporting the machine. You must know the rules or laws for transportation and safety that are used in each area that you will be in. Make sure that the truck and machine are equipped with the correct safety equipment.

Recovery transport

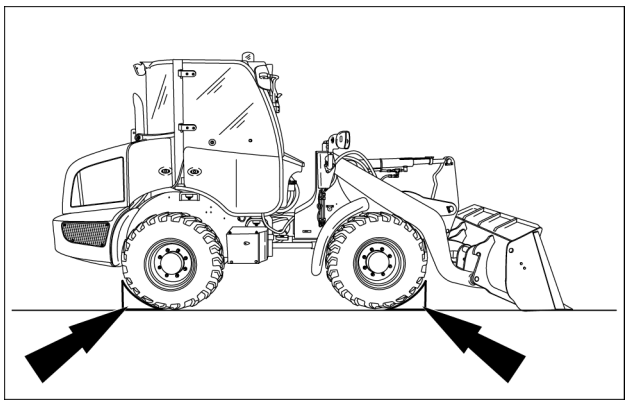
Transporting the machine

Transporting the machine on trailer

NOTICE: *make certain the truck and trailer are adequate for the machine. The truck, trailer, and machine must be equipped with the correct safety equipment for transport. Wide load escorts may be required for some machines. Remove all dirt, mud, snow, ice, oil, or grease from the trailer and ramp before loading or unloading the machine.*

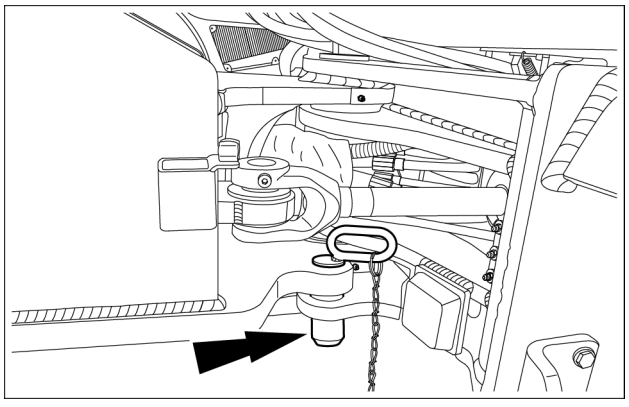
Use care when loading a machine.

1. Place a block at the front and rear of each trailer wheel.
2. Carefully move the machine SLOWLY onto the trailer.
3. Lower the loader bucket onto the trailer.
4. Apply the parking brake. Make sure the direction shift control switch is in the NEUTRAL position and loader controls are in the HOLD position. Stop the engine.
5. Remove the key. Turn the batter main switch to the OFF position.
6. Lock all doors, hoods, and access panels.
7. Place wheel chocks against the tires to prevent machine movements.



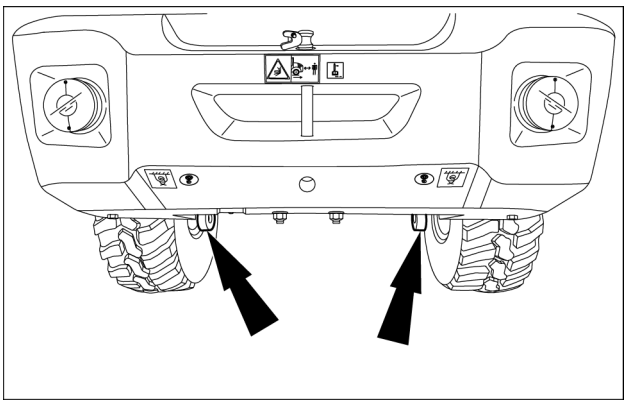
LEIL14CWL0118AB 1

8. Place the transport safety pin in the locked position.



LEIL15CWL0087AB 2

9. Use provided tie down locations to safely secure the machine.



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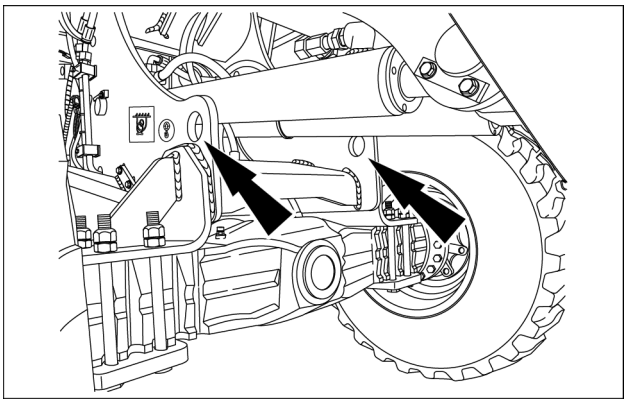
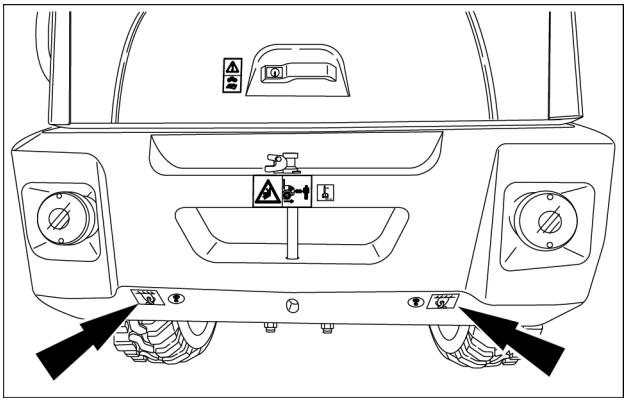


LEIL15CWL0103AA 4

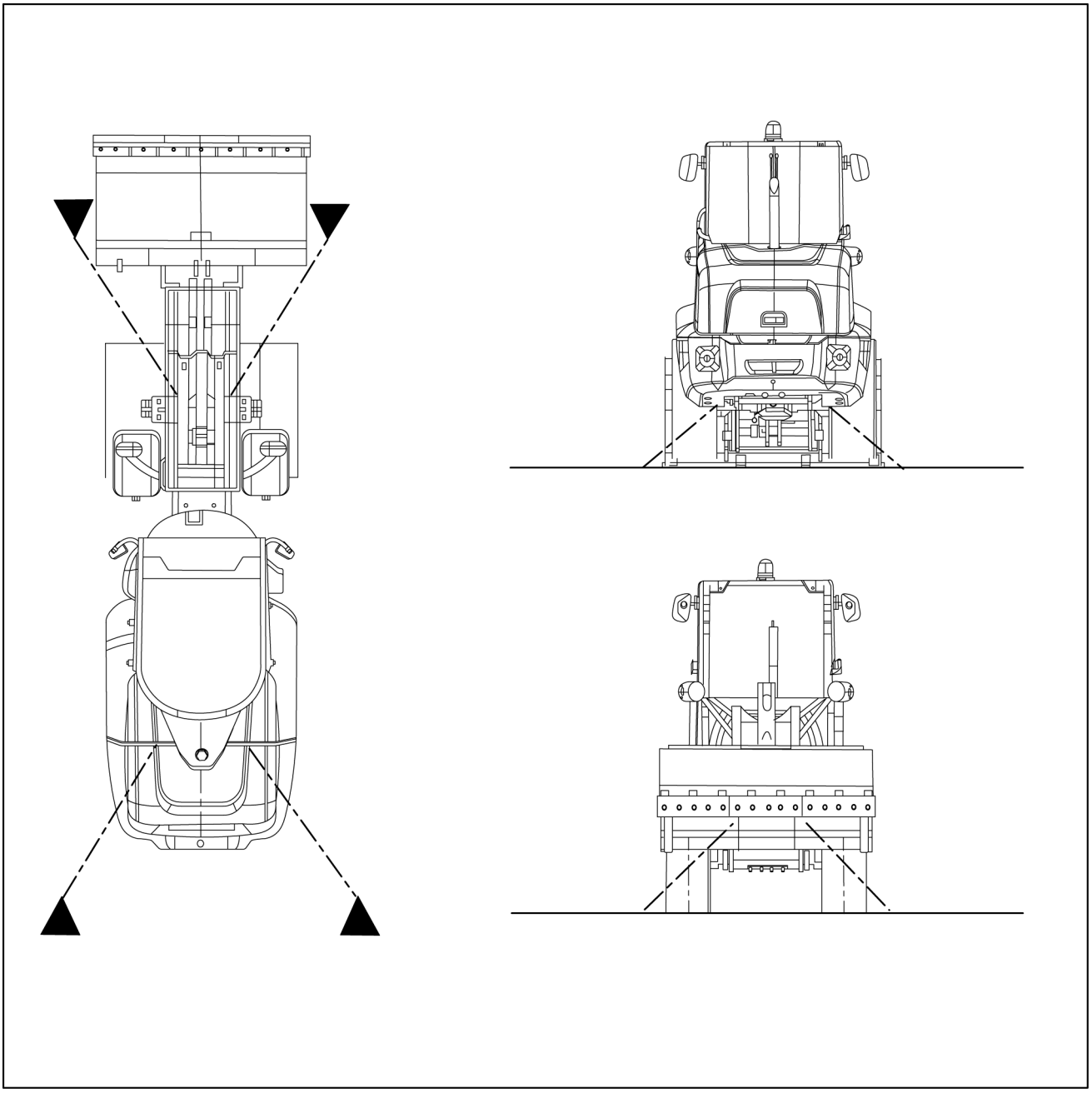
10. Chains must be securely fastened to the left-hand and right-hand rear tie down holes and the trailer. Tie down locations are indicated on the machine with tie down decals.



LEIL15CWL0104AA 5

11. Put a cover over the exhaust pipe.
12. Measure the distance between the ground and the highest point of the machine. You must know the clearance height of the machine on the trailer.
13. Advise driver of weights of machine and attachments if special permits or guidelines are necessary.

Chains must be securely fastened to the tie down points of the machine.
Chains must be securely fastened and properly placed to the trailer, according to the following scheme.



LEIL14CWL0413GA 6

Transporting the machine by rail or ship

Transport by rail or ship is subject to specific regulation. Consult an approved organization.

Towing

⚠ WARNING

Misuse hazard!
Towing is a delicate maneuver that is always carried out at the risk of the user. The manufacturer's warranty does not apply to incidents or accidents that occur during towing. Where possible, carry out the repairs at the site.
Failure to comply could result in death or serious injury.

W0286A

⚠ WARNING

Loss of control hazard!
Never use the differential lock at speeds above 5.0 km/h (3.1 mph) or at any time when turning the machine.
Failure to comply could result in death or serious injury.

W1354A

NOTE: *the instruments represented may not exactly correspond to the instruments on your machine.*

The machine must be towed only at the low speed of approximately **2 km/h** (**1.24 mph**) and over a maximum distance of **1.0 km** (**0.6 miles**).
Otherwise the travel motor would get damaged because of overheat.

After recovery, the machine must be secured against rolling away and inadvertent starting.

Tow the machine with a tow rod or a tow rope only.
The rod or the rope must be not damaged. They must be dimensioned in such a way that their theoretical breaking load is equal to three times the tractive power of the towing machine.

The towing vehicle must have sufficient tractive power.

Nobody must stay near the towing rod or rope.

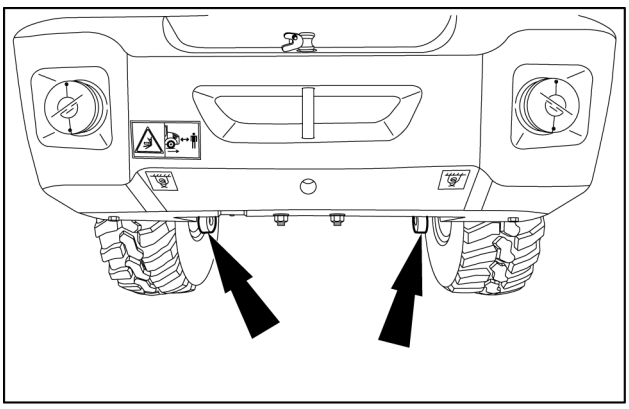
Tow away only if the breaks and the steering of the machine are functional and if the machine cannot be transported with other means.

Tow non-functioning machines as far as needed to remove them from the hazard area.

NOTICE: *never use the machine to tow trailers.*

Use the two rear tie down locations to tow other vehicles.

If the rear tie down locations are used for towing, the machine can tow one-and-a-half times its own weight.



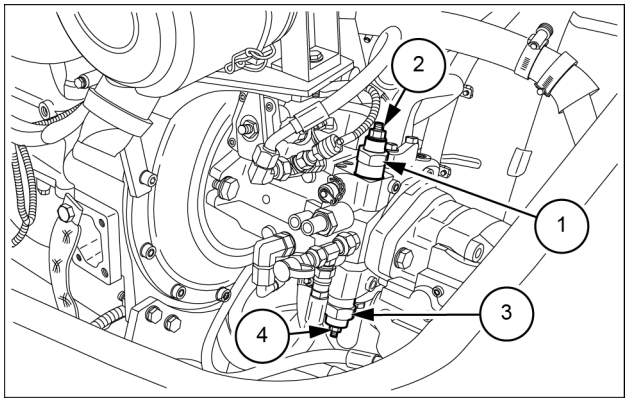
LEIL14CWL0109AB 1

Hydrostatic pump

Before towing the machine:

- Remove the caps from the valves on the hydrostatic pump for forward and reverse travel control.
- Loosen the nut **(1)** or **(3)** by 1/2 or 2 turns.
- Hold the nut with a wrench and with an Allen wrench turn down the setscrew **(2)** or **(4)** until it is flush with the nut **(1)** or **(3)**. Tighten the nut

After towing, loosen the hex nut **(1)** or **(3)**. Unscrew the setscrew **(2)** or **(4)** completely and retighten the nut **(1)** or **(3)**.



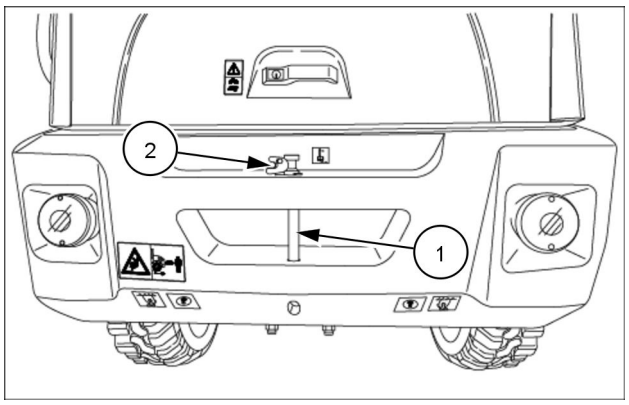
LEIL14CWL0622AB 2

If the machine is to be towed more than **1.0 km** (**0.6 miles**) you must disconnect the front and rear drive shafts or transport the machine on a trailer.

Towing lug

The towing lug **(1)** is located at the rear of the machine. Never use the towing lug to tow trailers.

Lift the catch **(2)** to extract the towing lug **(1)**.



LEIL14CWL0631AA 3

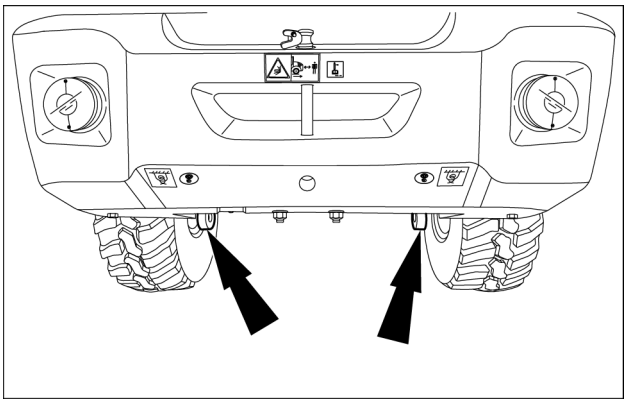
All the machine models (21F, 121F, 221F and 321F) have the same maximum towing load, as shown in the following table.

Model	Maximum allowed load for towing	
	Horizontal	Vertical
21F–121F–221F–321F	**32 kN** (**7194 lb**)	**12 kN** (**2698 lb**)

Lifting

Use a lifting device with a capacity sufficient to lift the machine (including the accessories if installed).

To lift the machine use the tie down points. The machine must be lifted entirely.
Before lifting check that all doors, cab and other mobile parts are secured.
Stay at a safe distance during lifting.



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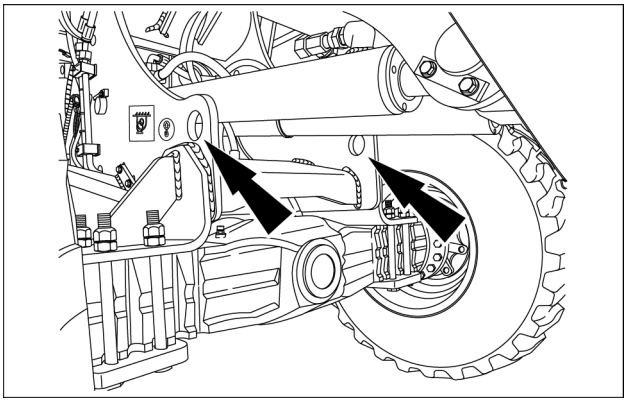
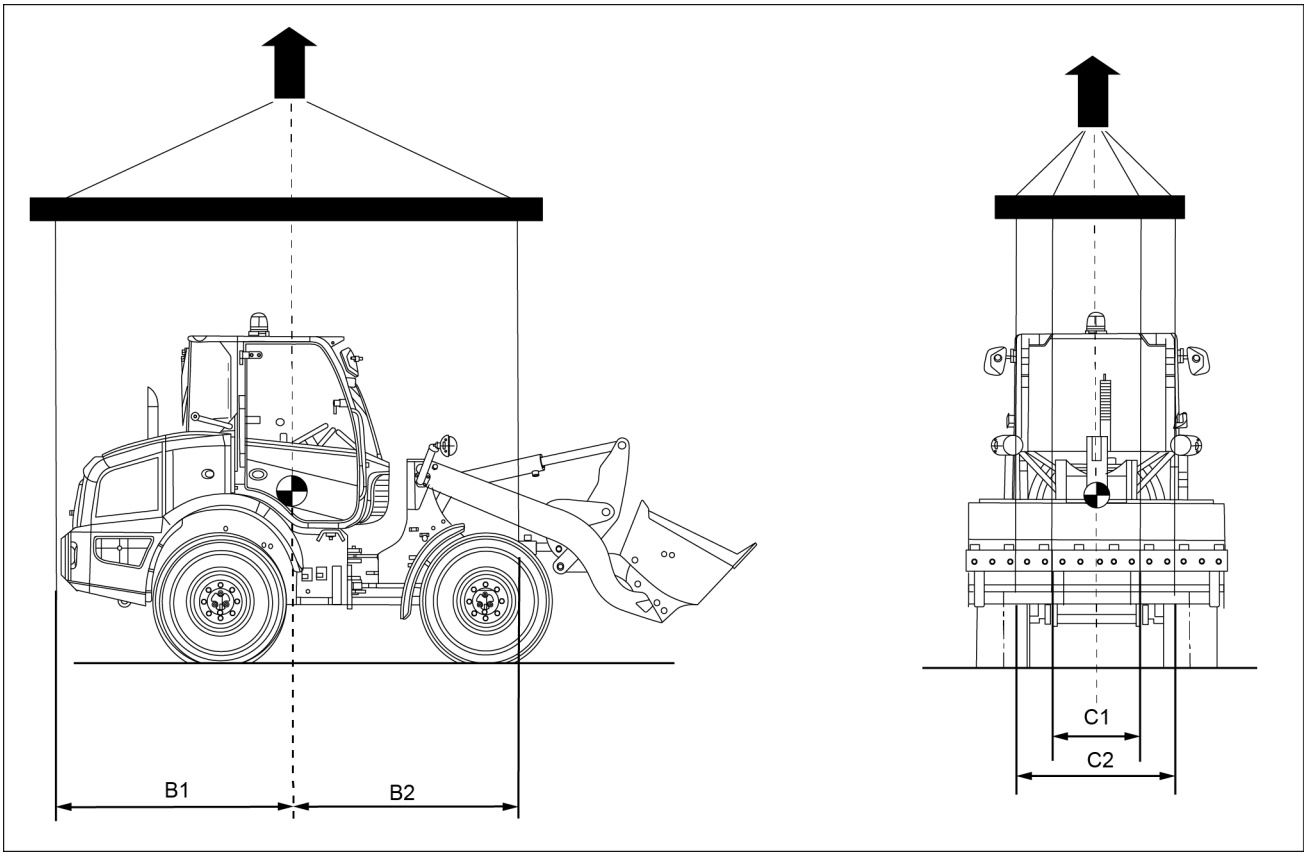


LEIL15CWL0103AA 2

Beware of chains or wire ropes that are pinched and bent: do not use them for lifting or towing. Always wear heavy gloves when handling them.

The chains must be firmly secured. Ensure that the connection is strong enough to hold the expected load. No one must be in proximity of the coupling, chains or tow ropes. Do not pull or tow when the operator cabs of the machines involved are not equipped with the necessary protections against “whiplash” of the chains or cables if they were to become disconnected or break.

The chains of the lifting device must be securely fastened to the tie down/lifting points. Lifting points are located at a specific distance from the Center of Gravity (COG) of the machine, as shown by the following lift up scheme.



LEIL15CWL0076FB 3

MODEL	B1	B2	C1	C2
	COG – rear lift up point	COG – front lift up point	Rear lift up point distance	Front lift up point distance
21F Z-bar	**2080 mm** (**81.9 in**)	**1330 mm** (**52.4 in**)	**970 mm** (**38.2 in**)	**500 mm** (**19.7 in**)
21F XT	**1990 mm** (**78.3 in**)	**1410 mm** (**55.5 in**)	**970 mm** (**38.2 in**)	**500 mm** (**19.7 in**)
121F Z-bar	**2045 mm** (**80.5 in**)	**1360 mm** (**53.5 in**)	**970 mm** (**38.2 in**)	**500 mm** (**19.7 in**)
121F XT	**1960 mm** (**77.2 in**)	**1450 mm** (**57.1 in**)	**970 mm** (**38.2 in**)	**500 mm** (**19.7 in**)
221F Z-bar	**2195 mm** (**86.4 in**)	**1450 mm** (**57.1 in**)	**700 mm** (**27.6 in**)	**500 mm** (**19.7 in**)
321F Z-bar	**2095 mm** (**82.5 in**)	**1550 mm** (**61 in**)	**700 mm** (**27.6 in**)	**500 mm** (**19.7 in**)

6 - WORKING OPERATIONS

Loader operations

Operating tips

⚠ WARNING

Impact hazard!
Bucket edge or teeth can catch on frozen surfaces or buried objects during surface scraping operations. Before operation, inspect the area for hazardous objects. Operate the machine at slow speed around objects.
Failure to comply could result in death or serious injury.

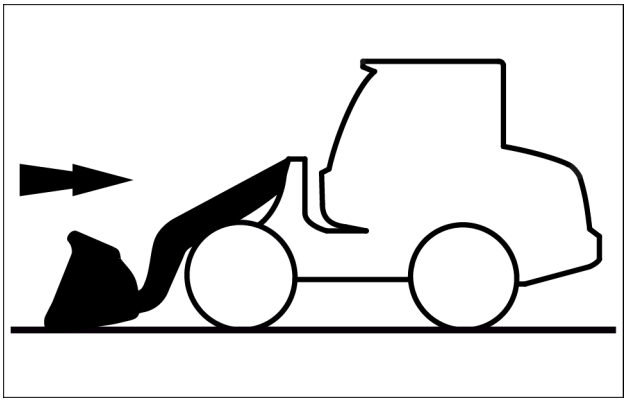
W0459A

This Compact Wheel Loader, with standard equipment and authorized attachments, is intended to be used for above ground level digging and general earth moving purpose such as land leveling, truck loading, material rehandling and ditch cleaning. If the machine is to be used for lifting objects, make sure that the machine is properly equipped and follow the instructions and safety precautions in this manual.

Leveling operation

Always operate the machine in reverse for leveling the surface. The activation of the float function is suggested prior to leveling the surface.

NOTE: *see "Loader functions" – Chapter 4 for more information about the float function.*



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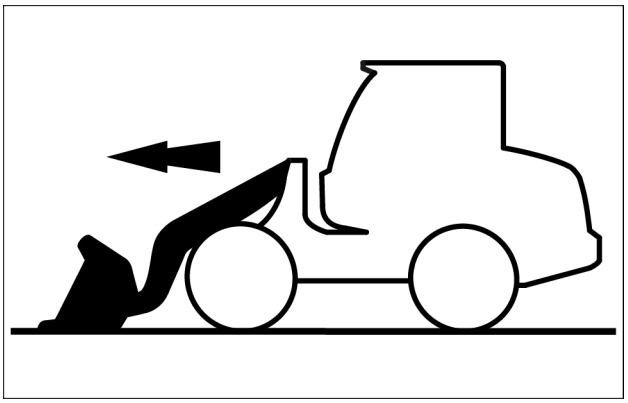
Pushing operation

When pushing material, do not set the bucket dumping angle more than **20°**.

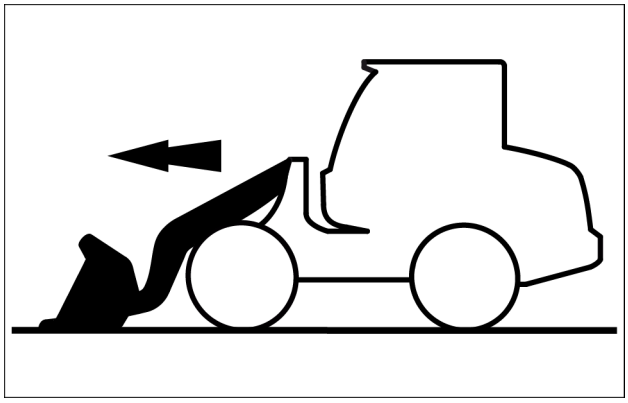
NOTICE: *the bucket MUST NOT be in the FULL DUMP position during the pushing operation.*



LEIL13CWL0023AB 2

Scraping operation

When scraping hard or frozen surfaces the bucket must be level and flat to the surface. Operate the machine at a slow speed.

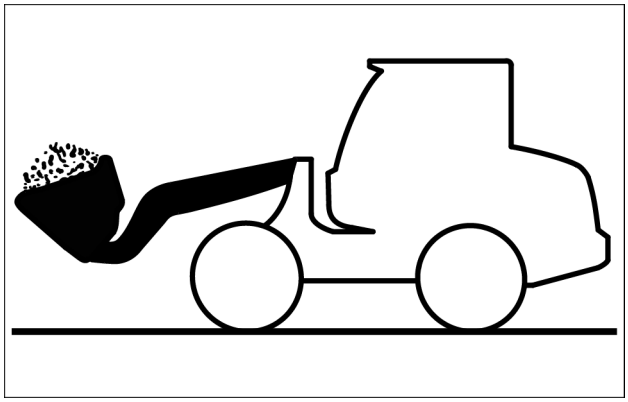


LEIL13CWL0023AB 3

Transport and carry operation

The bucket must be in the roll back position and the bottom of the bucket must not be more than **305 – 457 mm** (**12.0 – 18.0 in**) off the surface.

NOTICE: *when you operate the machine, keep the loader bucket as low as possible. This low position gives better balance and permits you to see more clearly. If the bucket is full and you move the machine over ground that is rough or surfaces that can cause the machine to slide, always operate at slow speed.*



LEIL13CWL0024AA 4

Operating on a slope

⚠ WARNING

Driving hazard!
Hillside operations can be dangerous. Rain, snow, ice, loose gravel, or soft ground, etc. can change the ground conditions. You must make a judgment if it is safe to operate your machine on any hillside or ramp.
Failure to comply could result in death or serious injury.

W0144A

Before you operate this machine on a hill, always put the transmission in a lower range and test the brakes. DO NOT let the machine move down a hill with the transmission in NEUTRAL.

- Use extra caution on hillside operations.
- Make sure that the low speed travel is selected.
- Always travel in the same direction as the slope, to prevent the machine from turning over.

NOTICE: *on steep slopes using the down shift mode of the transmission is recommended to aid braking and to help prevent brake over heating and premature disc wear.*

Operating the machine in water

⚠ WARNING

Driving hazard!
Do not operate the machine in a fast flowing stream. Fast flowing water can cause you to lose control of the machine.
Failure to comply could result in death or serious injury.

W0151A

- Make sure that the bottom of the stream, or water in which you will work, can support the weight of the machine.
- Do not allow the water level to reach the wheel rim.
- Before using the machine in water, inject large quantities of fresh grease into the appropriate grease fittings.
- After completing the operation make sure to inject fresh quantities of grease into any fitting that was in water.

Loader attachments

⚠ WARNING

Crushing hazard!
Always use approved attachments. Make sure the attachment is compatible with the machine mounting system.
Failure to comply could result in death or serious injury.

W0183A

⚠ WARNING

Falling object hazard!
Before operating the machine, always make sure the bucket or attachment is securely locked into the quick-attach plate. A loader bucket or attachment that is not securely locked into the quick-attach plate could come off during loader operation.
Failure to comply could result in death or serious injury.

W0166A

⚠ WARNING

Escaping fluid!
Do not disconnect hydraulic quick coupler under pressurized conditions. Make sure all hydraulic pressure is removed from the system before disconnecting hydraulic quick coupler.
Failure to comply could result in death or serious injury.

W0095A

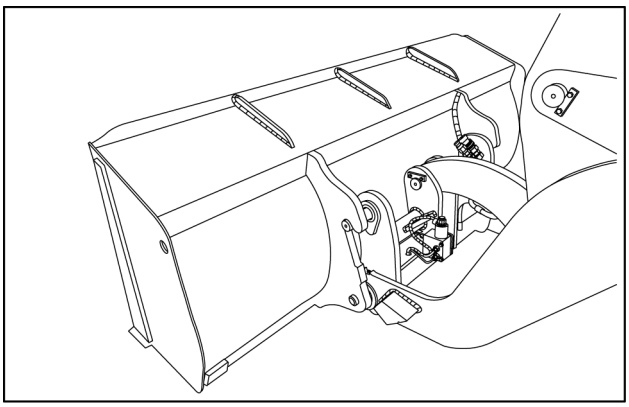
The machine can be equipped with three kinds of attachment coupler: Horizontal Pin Quick Coupler, Skid Steer Loader Quick Coupler (SSL compatible) and Mechanical coupler.

Quick Coupler

The attachment Quick Coupler system and coupler bucket will give your machine increased versatility and function. The ease of coupling, combined with a remote locking control allows for a single operator to handle the attachment coupling and uncoupling operation without special tools and without leaving the cab.
DO NOT operate or permit anyone to operate or service the machine and/or attachments until you or the other persons have read and understand the safety, operation, and maintenance instructions in this manual. Use only trained operators who have demonstrated the ability to operate the machine correctly and safely. The compact wheel loader with the attachment quick coupler system and bucket is intended to be used for digging and general earth moving purposes such as land leveling, truck loading, and material rehandling.

Horizontal Pin (HP) Quick Coupler

The Horizontal Pin (HP) Quick Coupler is a hydraulically operated attachment coupler system.



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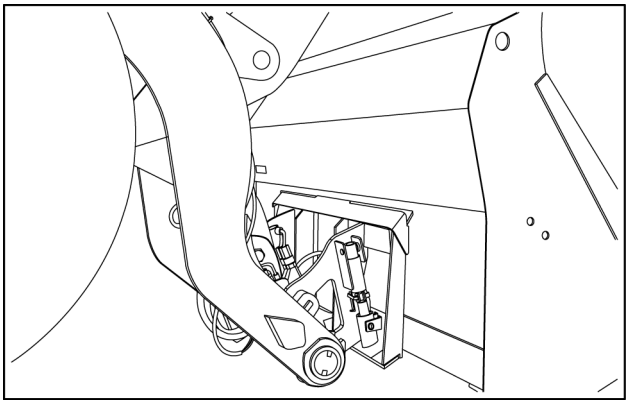
Skid Steer Loader Coupler (SSL compatible)

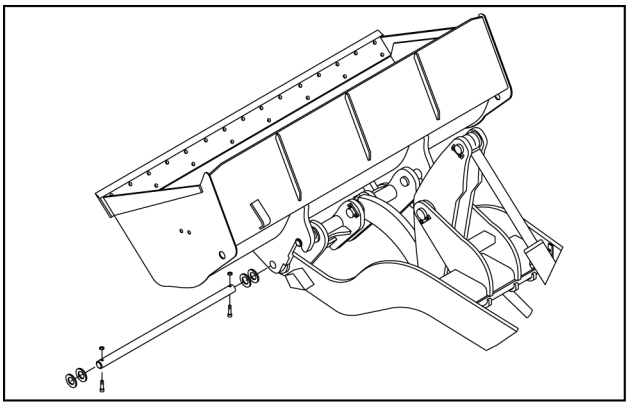
The Skid Steer Loader Quick Coupler is a hydraulically operated attachment coupler system.



LEIL15CWL0301AA 2

Mechanical coupler

The mechanical coupler is a system that requires the mechanical engagement of a locking pin when coupling the attachment.



LEIL14CWL0046AA 3

Safety precautions specific to attachment and coupler

- Always inspect the coupler locking pin extension before operating the machine. Position the locking pins in your field of vision, and make certain they are engaged properly.
- Improperly locked attachments could release and cause serious injury.
- Do not attempt to engage attachment with locking pins extended.
- Make certain that locking pins and connections are free of dirt or caked on mud before attempting to engage and disengage the attachment.
- Do not extend or retract coupler locking pins with attachment on the ground or in the dump position.
- If any damage is visible on the coupler or attachment points, do not operate or attach bucket.
- Never stand under an attachment or allow others to do so. Do not allow anyone under elevated loads.
- Do not lift loads or push materials with the coupler without an attachment. This can cause damage to the coupler components.
- Check coupler operation periodically for any unusual movement and/or noise.
- Inspect hydraulic hoses for any leaks or damage.
- Visually inspect welds and contact your dealer if there are anomalies.
- Check for any loose bolts. Torque as required.
- Do not modify the machine or attachments. Such modifications can damage and/or effect the integrity of the attachment and can effect safety and function of the attachment and/or machine.
- Prior to connecting or disconnecting the hydraulic connections of the hydraulic Quick Coupler, release the pressure in the hydraulic system. Make sure all hydraulic pressure is removed from the system.
  See “Releasing pressure in the hydraulic system” - Chapter 7 in this manual, for more information about the pressure release in the hydraulic system.

Coupling to the attachment

⚠ WARNING

Falling object hazard!
Before starting the machine, make sure the coupler switch is in the locked position.
Failure to comply could result in death or serious injury.

W0931B

⚠ WARNING

Falling object hazard!
Always visually inspect coupler locking pins for proper engagement. An improperly locked attachment could release and fall.
Failure to comply could result in death or serious injury.

W0930A

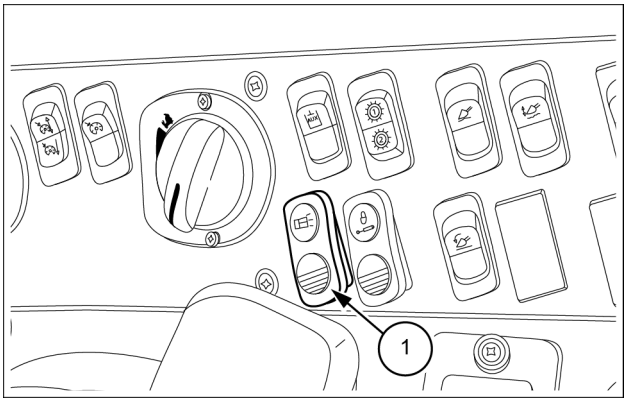
⚠ WARNING

Avoid injury and/or machine damage!
Before operating the machine, make sure the attachment is securely connected to the machine. Apply downward pressure with the bucket to the ground to make sure the coupler connection is secure.
Failure to comply could result in death or serious injury.

W0932A

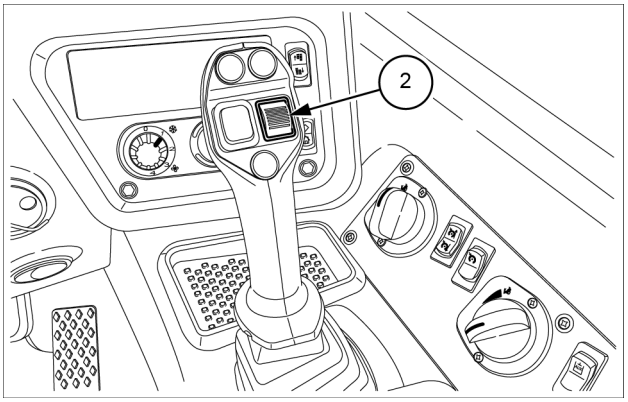
Horizontal Pin (HP) and SSL compatible Quick Coupler

1. Locate the Quick Coupler switch **(1)** on the dashboard in the right–hand side console, in the operator's compartment.
   The Quick Coupler switch **(1)** is secured by a mechanical lock against a possible accidental activation. To unlock the switch **(1)** from the mechanical lock, pull slightly the lock towards the operator. Then press on the symbol face of the Quick Coupler switch **(1)** to enable the Quick Coupler.



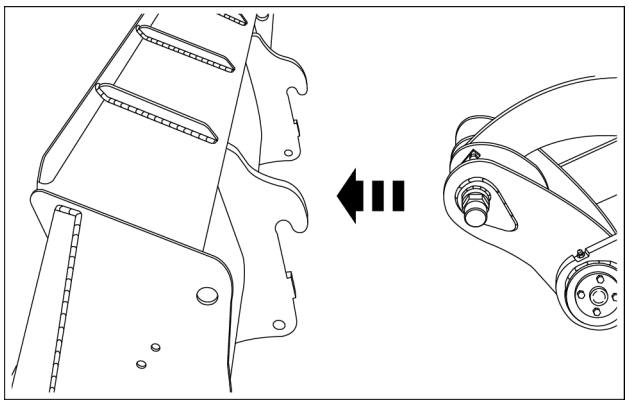
LEIL13CWL0019AB 1

2. Slide backward the roller **(2)** on the joystick to retract the locking pins. The red indicator lamp in the instrument cluster will illuminate and the locking pins will remain in the retracted position. Do not engage the attachment with locking pins extended.



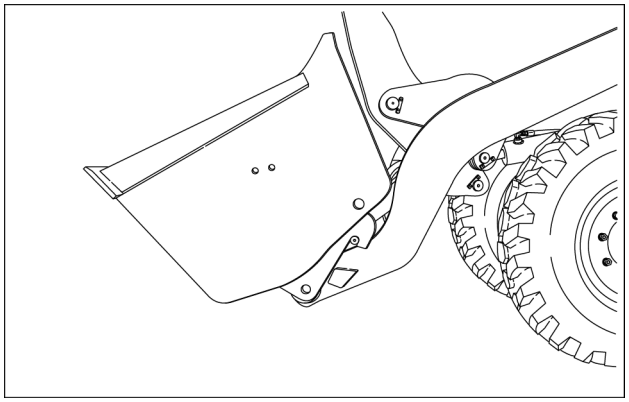
LEIL13CWL0020AB 2

3. Move the machine into position with the front of the coupler aligned with the attachment hooks. Position the front of the coupler into the attachment.



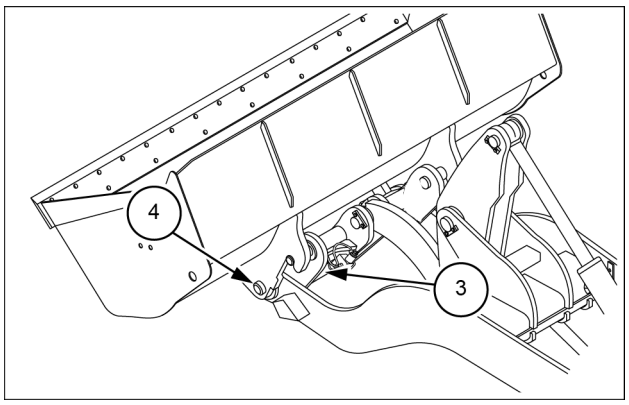
LEIL15CWL0136AB 3

4. HP Coupler
   Make certain the roller **(2)** remains in the unlock position. Roll back the coupler with the attachment to align the attachment pin holes with the coupler locking pins.
5. Slide forward the roller **(2)** to extend the locking pins. The locking pins should be fully extended.



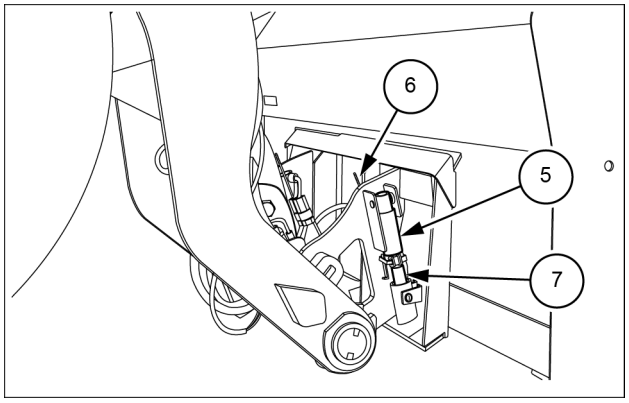
LEIL14CWL0410AA 4

6. HP Coupler
   Maintain the coupler in rollback position.
   Position the locking cylinder **(3)** in your full field of view to visually ensure and verify the locking pins **(4)** are fully extended.



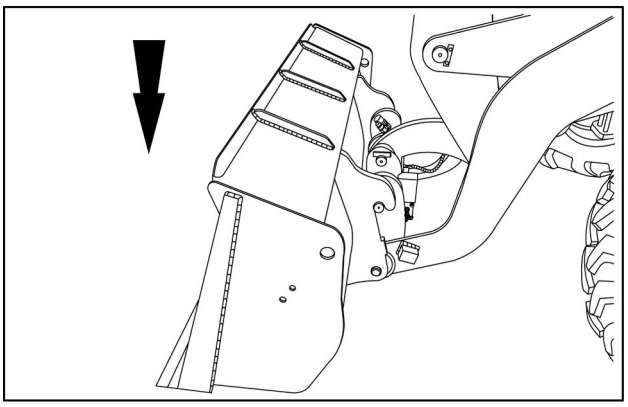
LEIL14CWL0116AB 5

6. SSL compatible Coupler
   Position the locking cylinders **(5)** in your full field of view to visually ensure and verify the position indicator rods **(6)** and locking pins **(7)** are fully downward extended.
   If only the white upper end of the rods **(6)** can be seen, the locking pins **(7)** are fully extended.



LEIL15CWL0323AB 6

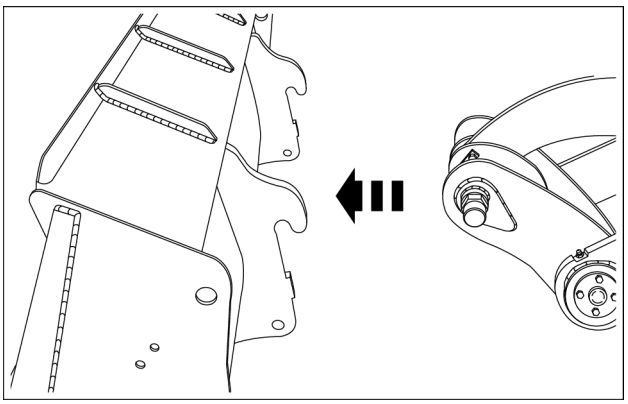
7. After visually inspecting the locking pins, lower the attachment, rolling the front end toward the ground. Apply downward pressure to make certain the attachment is securely locked in place.



LEIL14CWL0050AA 7

Mechanical coupler

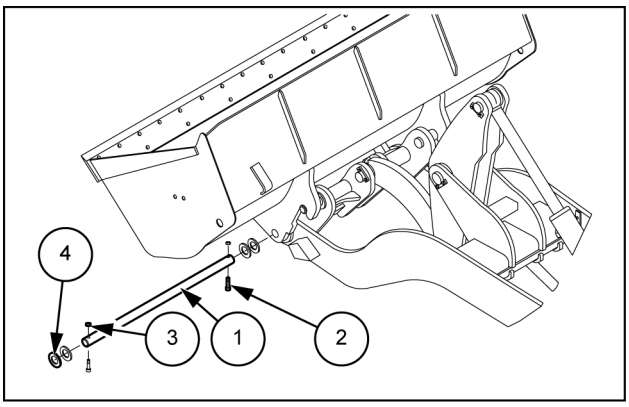
1. Move the machine into position with the front of the coupler aligned with the attachment hooks. Position the front of the coupler with the attachment.



LEIL15CWL0136AB 8

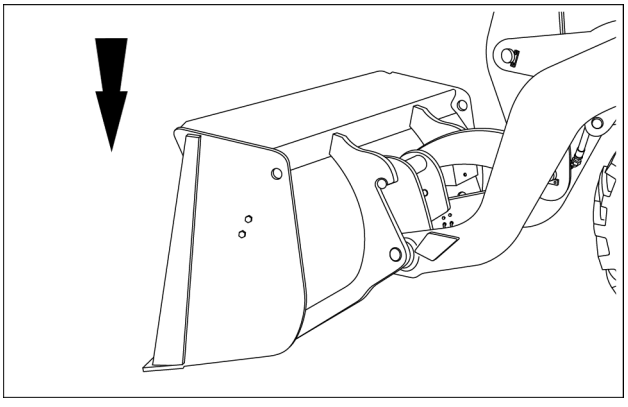
2. Roll back the coupler with the attachment to align the attachment pin holes with the coupler locking pin holes.

3. Place the direction shift switch of the joystick on NEUTRAL and shut down the engine.
   Insert the locking pin **(1)** in the aligned holes of the coupler and use the screws **(2)**, the nuts **(3)** and the shims **(4)** to lock it in place.
   Ensure and verify the locking pin **(1)** is securely locked.



LEIL14CWL0047AB 9

4. Start the engine and lower the attachment, rolling the front end toward the ground. Apply downward pressure to make certain the attachment is securely locked in place.



LEIL14CWL0418AA 10

Uncoupling the attachment

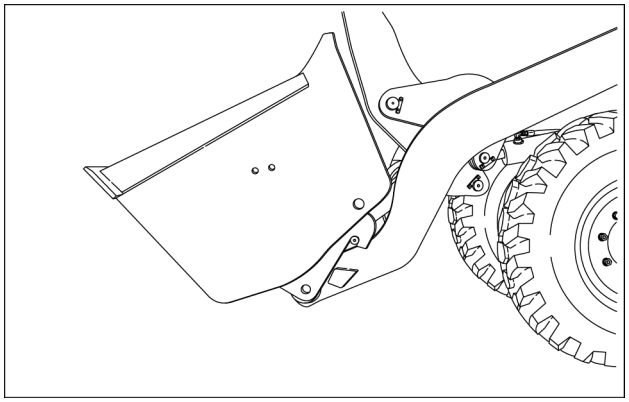
⚠ WARNING

Avoid injury and/or machine damage!
Before disconnecting the couplers, you must:
-lower the connected attachments,
-stop the engine,
-move the control levers forward and backward to discharge pressure from the hydraulic system.
Failure to comply could result in death or serious injury.

W0933A

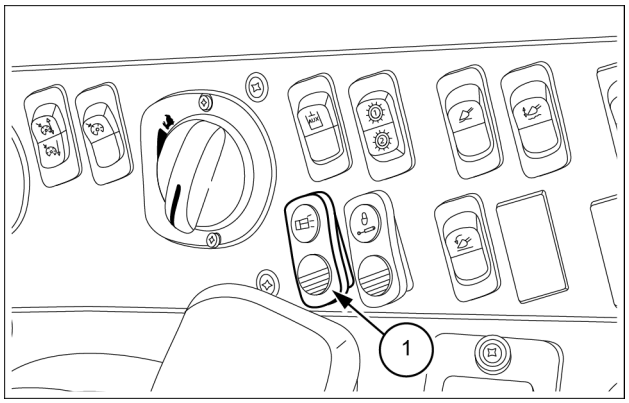
Horizontal Pin (HP) Quick Coupler

1. Lower the lift arm and position the coupler in the roll back position.



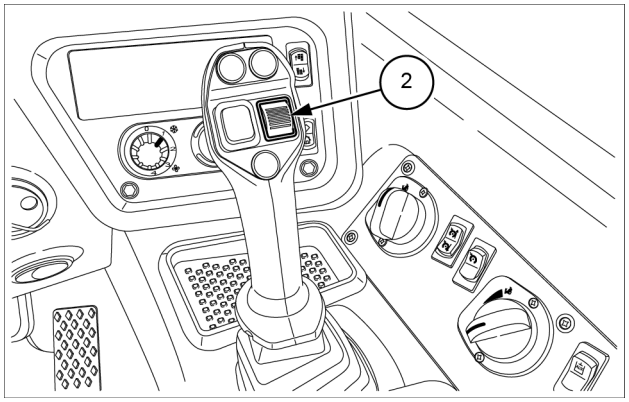
LEIL14CWL0410AA 1

2. Locate the Quick Coupler switch **(1)** on the dashboard in the right–hand side console, in the operator's compartment.
   The Quick Coupler switch **(1)** is secured by a mechanical lock against a possible accidental activation. To unlock the switch **(1)** from the mechanical lock, pull slightly the lock towards the operator. Then press on the symbol face of the Quick Coupler switch **(1)** to enable the Quick Coupler.



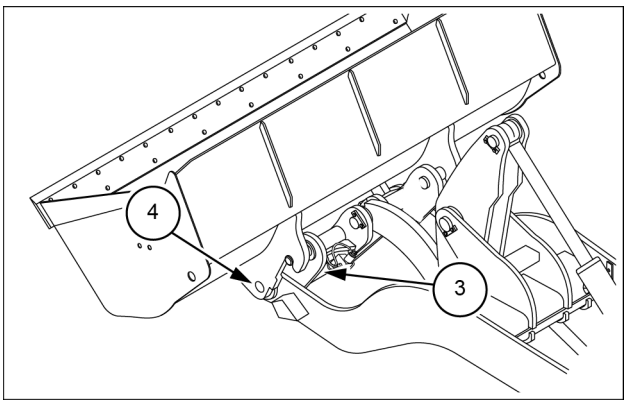
LEIL13CWL0019AB 2

3. Slide backward the roller **(2)** on the joystick to retract the locking pins. The red indicator lamp in the instrument cluster will illuminate and the locking pins will remain in the retracted position.. Do not retract the locking pins with the attachment on the ground or in the dump position.



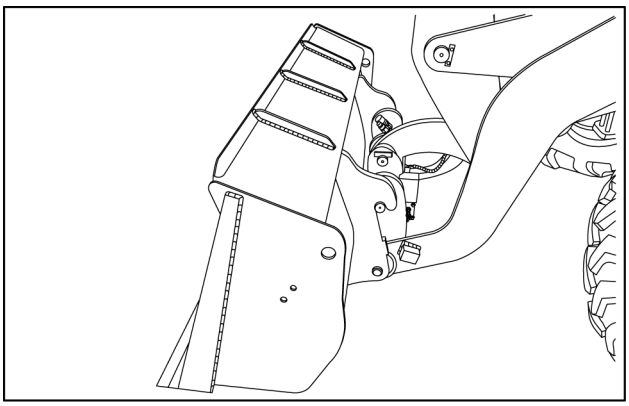
LEIL13CWL0020AB 3

4. Make certain the locking pins **(3)** are retracted. Maintain the coupler in rollback position.
   Position the locking cylinder **(4)** in your full field of view to visually ensure and verify the locking pins are completely retracted.



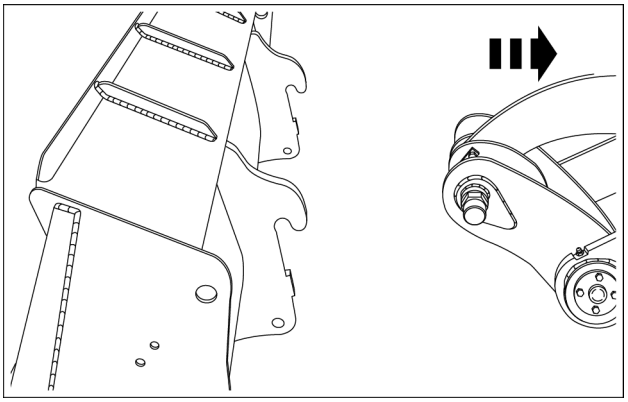
LEIL14CWL0117AB 4

5. After visually inspecting the locking pins, rest the attachment firmly and safely on the ground.



LEIL14CWL0050AA 5

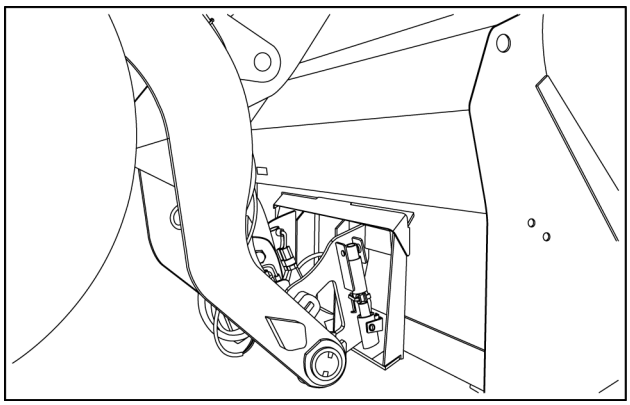
6. Roll the coupler forward and down, while slowly backing away from the attachment.



LEIL15CWL0137AB 6

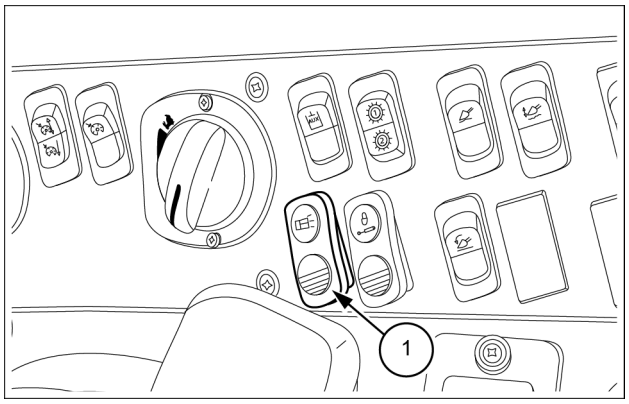
SSL compatible Quick Coupler

1. Lower the lift arm and roll back slightly the coupler.



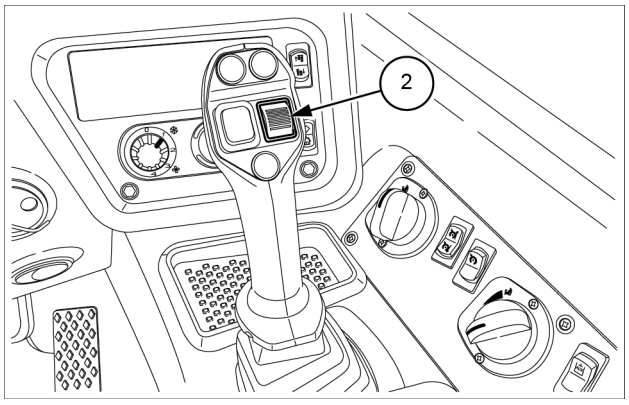
LEIL15CWL0301AA 7

2. Locate the Quick Coupler switch **(1)** on the dashboard in the right–hand side console, in the operator's compartment.
   The Quick Coupler switch **(1)** is secured by a mechanical lock against a possible accidental activation. To unlock the switch **(1)** from the mechanical lock, pull slightly the lock towards the operator. Then press on the symbol face of the Quick Coupler switch **(1)** to enable the Quick Coupler.



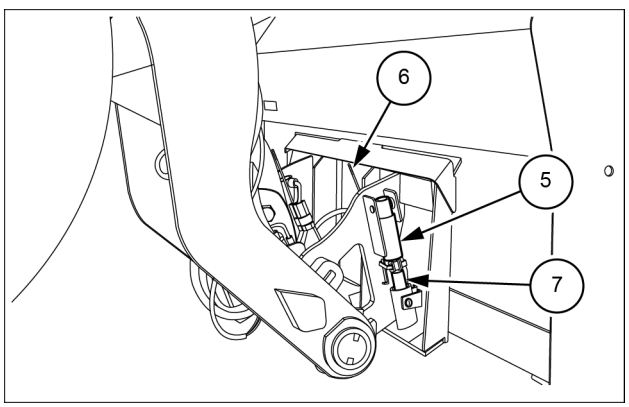
LEIL13CWL0019AB 8

3. Slide backward the roller **(2)** on the joystick to retract the locking pins. The red indicator lamp in the instrument cluster will illuminate and the locking pins will remain in the retracted position. Do not retract the locking pins with the attachment on the ground or in the dump position.



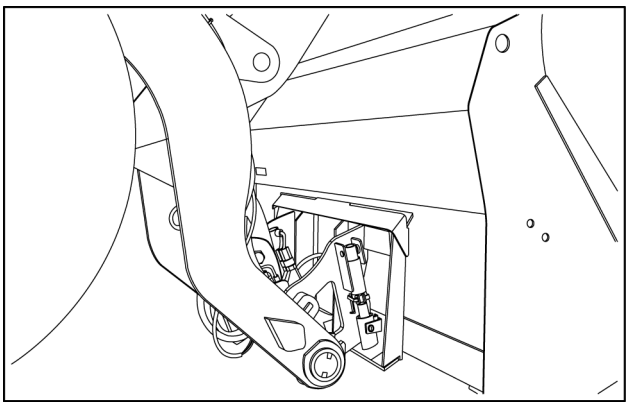
LEIL13CWL0020AB 9

4. Make certain the locking pins **(7)** are retracted. Position the locking cylinder **(5)** in your full field of view to visually ensure and verify the position indicator rods **(6)** and locking pins **(7)** are completely retracted.
   If the red stick of the rods **(6)** can be seen, the locking pins **(7)** are retracted.



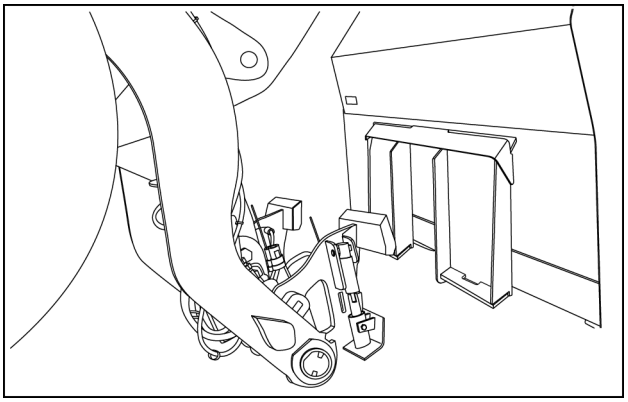
LEIL15CWL0302AB 10

5. After visually inspecting the locking pins, rest the attachment firmly and safely on the ground.



LEIL15CWL0301AA 11

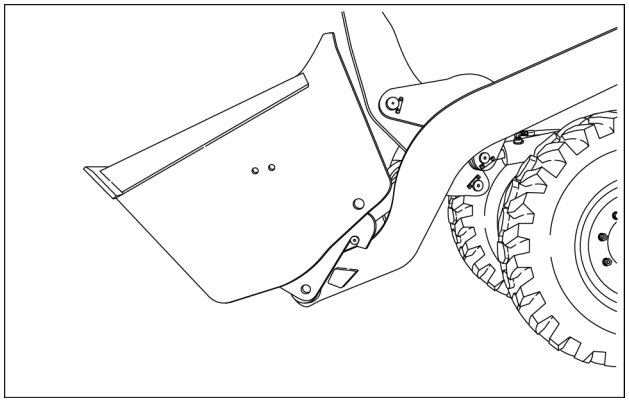
6. Slowly back away from the attachment.



LEIL15CWL0322AA 12

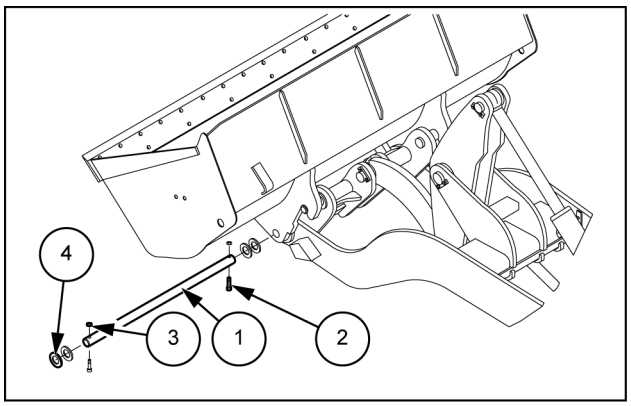
Mechanical coupler

1. Lower the lift arm and position the coupler in the roll back position.



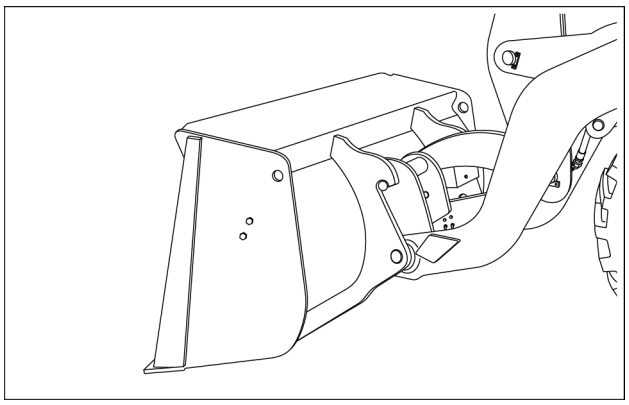
LEIL14CWL0410AA 13

2. Place the direction shift switch of the joystick on NEUTRAL and shut down the engine.
Remove the screws **(2)**, the nuts **(3)** and the shims **(4)** to remove the locking pin **(1)**.



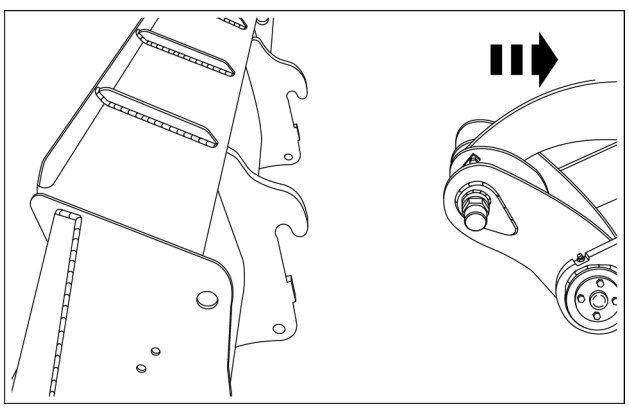
LEIL14CWL0047AB 14

3. Start the engine. Rest the attachment firmly and safely on the ground.



LEIL14CWL0418AA 15

4. Roll the coupler forward and down, while slowly backing away from the attachment.



LEIL15CWL0137AB 16

7 - MAINTENANCE

General information

Servicing

⚠ WARNING

Improper operation or service of this machine can result in an accident.
Read and understand the SAFETY INFORMATION Section before you perform any maintenance, service, or repairs. Read and understand the specific service procedures for the components you plan to work with before you start servicing the machine.
Failure to comply could result in death or serious injury.

W0138A

⚠ WARNING

Personal Protective Equipment (PPE) required.
When assembling, operating, or servicing the machine, wear protective clothing and PPE necessary for the particular procedure. Some PPE that may be necessary includes protective shoes, eye and/or face protection, hard hat, heavy gloves, filter mask, and hearing protection.
Failure to comply could result in death or serious injury.

W0353A

⚠ CAUTION

Burn hazard!
Wait for all components to cool before performing any operation.
Failure to comply could result in minor or moderate injury.

C0053A

Follow the maintenance intervals by checking the hourmeter every day. Before starting maintenance, park the machine on flat, firm ground, away from any obstacles, with the bucket/attachment on the ground. Keep all unauthorized personnel clear of the area. Unless otherwise specified, all maintenance operations should be carried out with:

- the engine stopped
- the machine parked on a firm, level surface
- the transport safety pin locked into position to stop the machine from unexpected articulation
- the parking brake engaged
- the key removed from the key switch
- a "DO NOT OPERATE" tag on the key switch
- wheel chocks blocking the wheels
- all circuits cooled down prior to starting work
- all hydraulic pressure released in lift arm and bucket/attachment circuits
- any accumulator pressure released for the appropriate circuit

Clean the grease fittings before lubrication. Clean around plugs and filler holes before adding fluid. No dust or dirt must enter the components or the circuits. Wear suitable clothing and remember to use the necessary safety equipment.

When performing service work on the machine, place a Do Not Operate tag on the instrument panel or key switch. Turn off engine and remove key before leaving operator's compartment.

Any modification to this machine without prior authorization could cause serious injury. Do not make any modifications without authorization. Consult your dealer.

The service intervals in this chapter refer to normal operating conditions. During the first operation period of a new machine (100 initial hours) or rebuilt component and under particularly severe conditions, the service intervals should be carried out more frequently.

NOTICE: *take particular care to replace all filters regularly. Clean filters mean longer engine running life.*

NOTICE: *oils and fluids must be disposed of properly.*

Hourmeter

The hourmeter enables service operations to be scheduled. Its hourly indications are the same as those of a clock when the engine is running.

Servicing intervals are carefully calculated to guarantee safe and efficient machine operation.

Be sure to carry out all the servicing operations properly as defined in this manual.

Variable periodic maintenance

Some working environments require that maintenance be performed more frequently. Dust, dirt, moisture, extreme hot or cold and many other factors should be taken into consideration when servicing the machine. Certain equipment or auxiliary tools may cause more stress on hydraulics, drivetrain, engines or filters. The following maintenance should be performed on regular schedules, but often need special attention when conditions require.

Engine air filter

Replace the primary element if the air filter indicator lamp illuminates.

The primary element may be cleaned, however a new element is recommended, if questionable. The inner element cannot be cleaned and must be replaced.
To periodically clean the primary air filter, hold with the rubber seal facing down. Tap all sides of the filter with your hand. Blow the filter out with compressed air — maximum pressure **4.8 bar** (**70 psi**). Hold the nozzle a minimum of **7.6 cm** (**3 in**) away from filter. Use a nozzle diameter no smaller than **6.4 mm** (**0.25 in**). Inspect the filter for damage. Wipe the filter seal off and clean all dust from air cleaner housing. Never use water to clean the primary filter.

Tires and wheels

Adjust the inflation pressure of the tires when circumstances require. Keep tires properly inflated and check torque of wheel bolts/studs.

Wheels should be checked for proper torque every twenty hours when new and until they remain tight.

Air conditioning condenser

The air conditioning condenser is located in the cooling box at the rear of the machine. Use compressed air to remove debris and build up on the condenser.

Fuel prefilter

Raise the engine hood and drain water and sediment from the fuel prefilter. Slowly loosen the drain valve located under the filter until clean fuel runs out.
Retighten the valve and replace connectors. Do not overtighten valve. This procedure should be a periodic maintenance procedure dependent upon climate and use conditions. See the complete procedure for the fuel prefilter and fuel filter in this section.

Priming the fuel system

Prolonged period of inactivity or running out of fuel may allow air to get into the fuel system. If this should happen make sure the tank is full and then prime the system using the manual priming pump on the fuel pre-filter.

Fuses

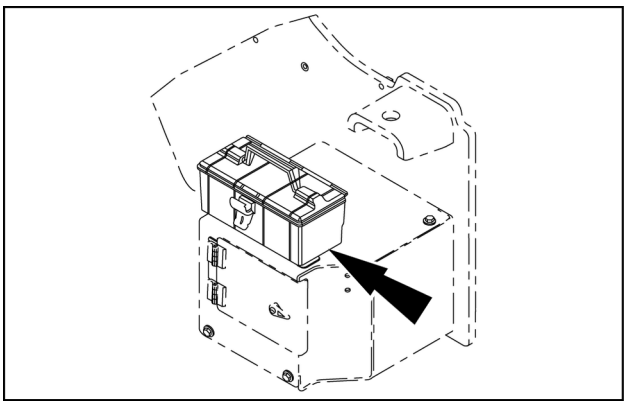
Fuses may be reached by opening the access door located on the right–hand side of the cab. If a fuse has blown the indicator light will illuminate.

NOTE: *if a fuse blows, replace it at once. Locate the problem and if it reoccurs, have it checked by a service technician.*

Tool box

A maintenance tool box shall be provided on the machine to accommodate tools and accessories for ordinary maintenance.

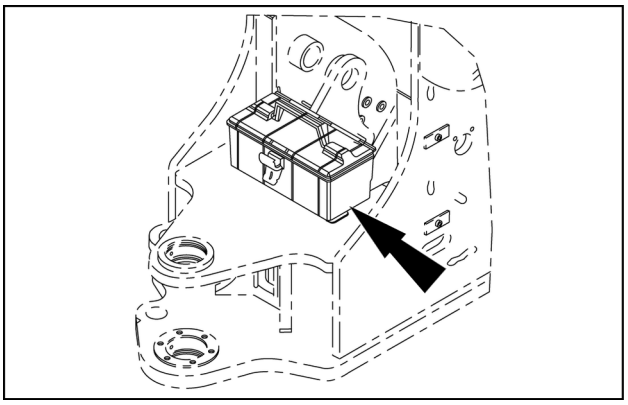
For the 21F and 121F models, the tool box is located outside the cab, above the battery compartment on the right-hand side.



LEIL15CWL0078AA 1

21F and 121F tool box

For the 221F and 321F models, the tool box is located outside the cab and is fixed to the front frame.



LEIL15CWL0079AA 2

221F and 321F tool box

Releasing pressure in the hydraulic system

⚠ WARNING

Pressurized hydraulic fluid can penetrate the skin and cause severe injuries.
Hydraulic fluid is under extreme pressure. Rest the bucket or attachment on the ground. Shut the engine off, turn the key on, and move the hydraulic control lever through all movements several times to relieve residual pressure in the system.
Failure to comply could result in death or serious injury.

W0161A

⚠ WARNING

Escaping fluid!
Hydraulic fluid or diesel fuel leaking under pressure can penetrate the skin and cause infection or other injury. To prevent personal injury: Relieve all pressure before disconnecting fluid lines or performing work on the hydraulic system. Before applying pressure, make sure all connections are tight and all components are in good condition. Never use your hand to check for suspected leaks under pressure. Use a piece of cardboard or wood for this purpose. If injured by leaking fluid, see your doctor immediately.
Failure to comply could result in death or serious injury.

W0178A

⚠ WARNING

Escaping fluid!
Do not disconnect hydraulic quick coupler under pressurized conditions. Make sure all hydraulic pressure is removed from the system before disconnecting hydraulic quick coupler.
Failure to comply could result in death or serious injury.

W0095A

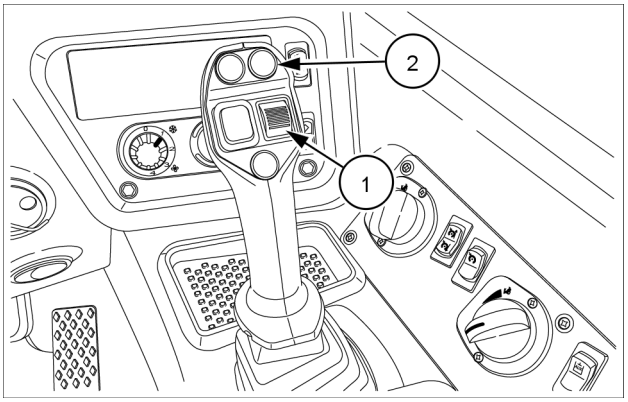
⚠ WARNING

Burn hazard!
Before performing any service on the hydraulic system, you must allow it to cool. Hydraulic fluid temperature should not exceed 40 °C (104 °F).
Failure to comply could result in death or serious injury.

W0241A

1. Park the machine on firm, level ground, lower the bucket/attachment to the ground and stop the engine.
2. Keep all non-authorized personnel clear of the machine. Turn the ignition switch key to the “ON” position.
3. Move the joystick slowly forward and backward and from the right-hand to the left-hand three or four times. Turn the ignition key to the OFF position.
4. To release the pressure of the 3rd hydraulic function, move the roller **(1)** of the joystick forward and backward two or three times.
   To release the pressure of the 4th hydraulic function (if present), press and hold the switch **(2)** to switch from the 3rd to the 4th hydraulic function, then move forward and backward the roller **(1)** two or three times. Turn the ignition key to the OFF position.

NOTICE: *before carrying out any service work on the hydraulic system, it is necessary to allow the system to cool: the temperature should not be more than* ***40 °C*** *(****104.0 °F****).*



LEIL14CWL0084AA 1

General specification - Diesel fuel

Only use diesel fuel that conforms to North American standard **ASTM D975** Grade No. 2-D S15 or equivalent in your engine. Do not use any other low grade diesel fuel.

NOTICE: *Use of other low grade diesel fuels will result in loss of engine power, high fuel consumption, and damage to the exhaust aftertreatment system (if equipped).*

NOTE: *When operating the machine in very cold climates, the use of winter blended fuel is permitted for a short period of time. See your fuel supplier for winter fuel requirements in your area.*

Fuel conditioner

Diesel fuel conditioner is available from your CASE CONSTRUCTION dealer. Instructions for the use of the fuel conditioner is on the container.

The use of diesel fuel conditioner will:

- Clean fuel injectors, valves, and manifolds for increased service life
- Disperse insoluble gummy deposits that form in the fuel system
- Separate moisture from the fuel
- Stabilize fuel in storage

NOTICE: *Use only CASE CONSTRUCTION approved biocide additives to prevent damage to the exhaust aftertreatment system (if equipped).*

General specification - Biodiesel fuels

Biodiesel usage in CASE CONSTRUCTION products

Introduction to Fatty Acid Methyl Ester (FAME) biodiesel

FAME biodiesel, called biodiesel fuel in the following section, consists of a family of fuels derived from vegetable oils treated with methyl esters.

There are two main biodiesel fuel types: Rapeseed Methyl Ester (RME) and Soybean Methyl Ester (SME). RME is a blend of rapeseed and sunflower methyl ester, and is the preferred crop in Europe. SME is the preferred crop in the United States.

Biodiesel fuel is a renewable alternative fuel source. Its use and development is promoted worldwide, especially in Europe and in the United States.

NOTICE: *Your emissions control system is compatible with up to **5%** biodiesel fuel (B5). Be aware that the use of biodiesel fuel that does not comply with the standards mentioned in this section could lead to severe damage to the engine, fuel system or aftertreatment system of your machine. The use of non-approved fuels may void CASE CONSTRUCTION Warranty coverage.*

Biodiesel can be used to run Tier 4B (final) and Stage IV diesel engines only when blended with standard diesel fuel:

- B5: indicates the blend of **5%** biodiesel and **95%** diesel fuels.
- B20: indicates the blend of **20%** biodiesel and **80%** diesel fuels. Do not use.

Biodiesel fuel has several positive features in comparison with diesel fuel:

- Biodiesel fuel adds lubricity to the fuel, which is beneficial in many circumstances, particularly as sulfur and aromatics are removed from the fuel.
- Biodiesel has a greater cetane number and burns cleaner.
- Biodiesel produces less particulate matter and reduces smoke emissions.
- Biodiesel is fully biodegradable and non-toxic.

Diesel and biodiesel fuel specifications

Tier 4B (final) and Stage IV diesel fuel specifications are covered by the following:

- **ASTM D975**, Standard Specification for Diesel Fuel Oils. (15 ppm sulfur maximum.)

Biodiesel blends are covered by:

- United States Diesel Fuel Specification **ASTM D975** allows up to **5%** biodiesel since 2009. United States fuel suppliers are allowed to use up to **5%** biodiesel fuel (B5) to supply the network.
- United States Biodiesel Fuel Specification **ASTM D7467** provides specifications for diesel and biodiesel blends from B5 to B20.

Pure biodiesel blend stock (B100) specification is covered by the following requirements:

- **ASTM D6751** - Standard specification for biodiesel fuel blend stock (B100) for middle distillate fuels.

  NOTE: ASTM D6751 *specification has been updated to improve the quality of biodiesel in the market place.*

Before raw oil can be converted into usable biodiesel fuel, it must undergo transesterification to remove glycerides. During the transesterification process, the oil reacts with an alcohol to separate the glycerine from the fat or vegetable oil. This process leaves behind two products: methyl ester (the chemical name for biodiesel) and glycerine (a byproduct usually sold for use in soaps or other products).

NOTICE: *Biodiesel fuels approved for use in the CASE CONSTRUCTION equipment must be transesterified and comply with the latest North America Standard **ASTM D6751**.*

NOTICE: *Cold Pressed Biodiesel, Cold Pressed Oil, Straight Vegetable Oil (SVO), or more generally unrefined vegetable oils used as motor fuel, are fuels that are normally made from Rapeseed oil or similar high oil content crops. These kinds of fuel are not transesterified, so they do not fulfil the **ASTM D6751** requirements. There is no recognized quality standard available for these types of fuel. Therefore the use of Cold Pressed Biodiesel, Cold Pressed Oil, Straight Vegetable Oil (SVO), or more generally unrefined vegetable oils used as motor fuel are NOT APPROVED at any blend in any CASE CONSTRUCTION product.*

NOTICE: *Any engine and fuel injection equipment fitted to a CASE CONSTRUCTION vehicle found to have run with any blend of NON-APPROVED fuel (fuel not fulfilling the specification described in the requirement **ASTM D6751**) will no longer be covered for Warranty by CASE CONSTRUCTION.*

Biodiesel fuel usage conditions

You must stringently follow the biodiesel fuel usage conditions. Incorrect application of the biodiesel fuel usage conditions could lead to severe damage to the engine, fuel injection equipment and aftertreatment system.

The main concerns related to operation with biodiesel fuels are:

- Filters and injector blockage caused by poor fuel quality.

- Wear and corrosion of internal components due to water content, which affects lubricity.
- Deterioration of some rubber sealing compounds in the fuel system.
- Biodiesel oxidation, which can lead to the formation of deposits that can harm the fuel injection system.

NOTICE: *Any problem in the engine fuel injection equipment associated with non-compliance to the following conditions for biodiesel fuel handling and maintenance will not be covered for Warranty by CASE CONSTRUCTION.*

Purchase biodiesel fuel from a trusted supplier who understands the product and maintains acceptable fuel quality. The National Biodiesel Board awards **BQ-9000®** accreditation to biodiesel marketers and producers that meet strict quality and consistency standards. Biodiesel users in North America are strongly encouraged to purchase biodiesel blends from the **BQ-9000®** Certified Marketers and sourced from the **BQ-9000®** Accredited Producers found on the **BQ-9000®** website.

The use of biodiesel blends up to B5 will not void the CASE CONSTRUCTION warranty as long as the following conditions for biodiesel fuel handling and maintenance are stringently followed:

Biodiesel fuel must be pre-blended by the supplier. Mixing biodiesel fuels on-site can result in an incorrect mixture that could damage the engine and/or fuel system.

NOTICE: *CASE CONSTRUCTION may void your warranty if the problem is associated with poor fuel quality due to improper blending. It is the responsibility of the fuel supplier and/or yourself to ensure the right type of fuel and blend is delivered and used.*

Storage

The machine should not be stored for more than 6 months with biodiesel in the fuel system. For longer storage time, it is strongly suggested that only regular #2 diesel fuel is used.

NOTE: *If storage for longer than 6 months is necessary, the engine must be run on regular #2 diesel for a minimum of 20 hours to flush the biodiesel fuel out of the fuel system prior to storage.*

Biodiesel is highly hygroscopic and tends to collect water more than diesel fuel. This increases the risk of algae and bacteria growth which can cause severe damage to the fuel injection system. Keep the machine fuel tanks and on-site storage tanks as full as possible to limit the amount of air and water vapors inside the tank. Drain water from the tanks at least once a week.

NOTICE: *Use only CASE CONSTRUCTION approved biocide additives on Tier 4B (final) and Stage IV engines with an exhaust aftertreatment system.*

Limited B10 biodiesel approval

CASE CONSTRUCTION approves the use of up to B10 on Tier 4B (final) and Stage IV engines only in Minnesota (or other States & Provinces) where the state legislation mandates its usage during the months of April to September only and the state legislation mandates strict compliance of the B10 to specification **ASTM D7467**. The B10 must consist of a blend of S15 #2D Diesel Fuel per **ASTM D975** and B100 blend stock per **ASTM D6751** only.

Fluids and lubricants

21F-121F — Capacities and specifications

Engine		
	Type of oil	**CASE AKCELA UNITEK NO. 1™ SBL CJ-4 SAE 10W-40** or **CASE AKCELA UNITEK CJ-4 ENGINE OIL SAE 15W-40**
		CASE AKCELA UNITEK NO. 1™ SSL CJ-4 SAE 0W-40 (cold weather + extreme weather package)
	Capacity (with filter change)	**7.0 L** (**7.4 US qt**)
Cooling system		
	Type of coolant	**CASE AKCELA ACTIFULL™ OT EXTENDED LIFE COOLANT** (OAT coolant)
	Total system capacity (50% coolant - 50% water)	**13 L** (**3.4 US gal**)
Fuel system		
	Type of fuel	Diesel fuel
		Arctic diesel fuel (cold weather + extreme weather package)
		PETRONAS TUTELA DIESEL ART ARCTIC FUEL ADDITIVE (extreme weather package)
	System capacity	**86.0 L** (**22.7 US gal**)
Hydraulic system and transmission		
	Type of fluid	**CASE AKCELA HYDRAULIC EXCAVATOR FLUID** (standard weather + cold weather package)
		CASE AKCELA HY-TRAN® ULTRACTION SSL (extreme weather package)
	Total system capacity	**53 L** (**14 US gal**)
	Reservoir capacity	**40.0 L** (**10.6 US gal**)
Axles		
	Type of oil	**CASE AKCELA GEAR 135 H EP LS** **SAE 80W - 90** **API GL-5**
	Front axle	
	Differential	**7.5 L** (**2.0 US gal**)
	Reduction gear (each side)	**0.7 L** (**0.2 US gal**)
	Rear axle	
	Differential	**7.5 L** (**2.0 US gal**)
	Reduction gear (each side)	**0.7 L** (**0.2 US gal**)
	Gearbox	**1.3 L** (**0.3 US gal**)
Brake system		
	Type of oil	**CASE AKCELA LHM FLUID**
	Service capacity	**1.0 L** (**1.1 US qt**)
Grease fittings, as required		**TUTELA MULTI-PURPOSE EP GREASE 251H, GR-9**

221F-321F (standard models)— Capacities and specifications

Engine		
	Type of oil	**CASE AKCELA UNITEK NO. 1™ SBL CJ-4 SAE 10W-40** or **CASE AKCELA UNITEK CJ-4 ENGINE OIL SAE 15W-40**
		CASE AKCELA UNITEK NO. 1™ SSL CJ-4 SAE 0W-40 (cold weather + extreme weather package)
	Capacity (with filter change)	**7.0 L** (**7.4 US qt**)
Cooling system		
	Type of coolant	**CASE AKCELA ACTIFULL™ OT EXTENDED LIFE COOLANT** (OAT coolant)
	Total system capacity (50% coolant - 50% water)	**13 L** (**3.4 US gal**)
Fuel system		
	Type of fuel	Diesel fuel
		Arctic diesel fuel (cold weather + extreme weather package)
		PETRONAS TUTELA DIESEL ART ARCTIC FUEL ADDITIVE (extreme weather package)
	System capacity	**86.0 L** (**22.7 US gal**)
Hydraulic system and transmission		
	Type of fluid	**CASE AKCELA HYDRAULIC EXCAVATOR FLUID** (standard weather + cold weather package)
		CASE AKCELA HY-TRAN® ULTRACTION SSL (extreme weather package)
	Total system capacity	**53 L** (**14 US gal**)
	Reservoir capacity	**40.0 L** (**10.6 US gal**)
Axles		
	Type of oil	**CASE AKCELA GEAR 135 H EP LS** **SAE 80W - 90** **API GL-5**
	Front axle	
	Differential	**8.0 L** (**2.1 US gal**)
	Reduction gear (each side)	**0.7 L** (**0.2 US gal**)
	Rear axle	
	Differential	**8.0 L** (**2.1 US gal**)
	Reduction gear (each side)	**0.7 L** (**0.2 US gal**)
	Gearbox	**1.3 L** (**0.3 US gal**)
Brake system		
	Type of oil	**CASE AKCELA LHM FLUID**
	Service capacity	**1.0 L** (**1.1 US qt**)
Grease fittings, as required		**TUTELA MULTI-PURPOSE EP GREASE 251H, GR-9**

221F-321F (“High Speed” models)— Capacities and specifications

Engine		
	Type of oil	**CASE AKCELA UNITEK NO. 1™ SBL CJ-4 SAE 10W-40** or **CASE AKCELA UNITEK CJ-4 ENGINE OIL SAE 15W-40**
		CASE AKCELA UNITEK NO. 1™ SSL CJ-4 SAE 0W-40 (cold weather + extreme weather package)
	Capacity (with filter change)	**7.0 L** (**7.4 US qt**)
Cooling system		
	Type of coolant	**CASE AKCELA ACTIFULL™ OT EXTENDED LIFE COOLANT** (OAT coolant)
	Total system capacity (50% coolant - 50% water)	**13 L** (**3.4 US gal**)
Fuel system		
	Type of fuel	Diesel fuel
		Arctic diesel fuel (cold weather + extreme weather package)
		PETRONAS TUTELA DIESEL ART ARCTIC FUEL ADDITIVE (extreme weather package)
	System capacity	**86.0 L** (**22.7 US gal**)
Hydraulic system and transmission		
	Type of fluid	**CASE AKCELA HYDRAULIC EXCAVATOR FLUID** (standard weather + cold weather package)
		CASE AKCELA HY-TRAN® ULTRACTION SSL (extreme weather package)
	Total system capacity	**53 L** (**14 US gal**)
	Reservoir capacity	**40.0 L** (**10.6 US gal**)
Axles		
	Type of oil	**CASE AKCELA GEAR 135 H EP LS** **SAE 80W - 90** **API GL-5**
	Front axle	
	Differential	**8.0 L** (**2.1 US gal**)
	Reduction gear (each side)	**0.7 L** (**0.2 US gal**)
	Rear axle	
	Differential	**8.0 L** (**2.1 US gal**)
	Reduction gear (each side)	**0.7 L** (**0.2 US gal**)
	Gearbox	**0.75 L** (**0.2 US gal**)
Brake system		
	Type of oil	**CASE AKCELA LHM FLUID**
	Service capacity	**1.0 L** (**1.1 US qt**)
Grease fittings, as required		**TUTELA MULTI-PURPOSE EP GREASE 251H, GR-9**

Engine oil - viscosity/temperature range

		0W-40 CJ-4 UNITEK to CNH MAT3521 or ACEA E9								
			10W-40 CJ-4 UNITEK to CNH MAT3521 or ACEA E9							
				15W-40 CJ-4 to CNH MAT3522 or ACEA E9 **						
-40 °C -40 °F	-30 °C -22 °F	-20 °C -4 °F	-10 °C 14 °F	0 °C 32 °F	10 °C 50 °F	20 °C 68 °F	30 °C 86 °F	40 °C 104 °F	50 °C 122 °F	

Maximum engine oil service change interval is **400 h

Hydraulic oil - temperature range

				CASE AKCELA HYDRAULIC EXCAVATOR FLUID						
	CASE AKCELA HY-TRAN® ULTRACTION SSL									
-40 °C -40 °F	-30 °C -22 °F	-20 °C -4 °F	-10 °C 14 °F	0 °C 32 °F	10 °C 50 °F	20 °C 68 °F	30 °C 86 °F	40 °C 104 °F	50 °C 122 °F	

Front and rear axle oil - viscosity/temperature range

				CASE AKCELA GEAR 135 H EP LS 80W-90						
-40 °C -40 °F	-30 °C -22 °F	-20 °C -4 °F	-10 °C 14 °F	0 °C 32 °F	10 °C 50 °F	20 °C 68 °F	30 °C 86 °F	40 °C 104 °F	50 °C 122 °F	

Fuel

Use diesel fuel suitable for the ambient temperature conditions (EN590).

Use grade No. 2 fuel. The use of other types of fuel can result in a loss of power of the engine and may cause high fuel consumption.

In very low ambient temperatures, use a mixture of fuels No. 1 and No. 2 as necessary. Consult your fuel supplier for appropriate fuel supply.

If the temperature falls below the fuel cloud point (point at which wax begins to form) the wax crystals will cause power loss or will prevent the engine from starting.

In cold weather, fill the fuel tank at the end of the day's work in order to prevent the formation of condensation.

Fuel storage

Prolonged storage of fuel can lead to the accumulation of impurities and condensation in the fuel. Engine trouble can often be traced to the presence of water in the fuel.

The storage tank must be placed outside and the temperature of the fuel should be kept as low as possible. Drain off water and impurities regularly.

Hydraulic and transmission fluid

CASE AKCELA HYDRAULIC EXCAVATOR FLUID is specifically designed for high pressure applications and for CASE CONSTRUCTION hydraulic systems. Your CASE CONSTRUCTION dealer can provide hydraulic and transmission fluid to fulfill different climate/temperature conditions. Refer to the charts at the beginning of this section.

Engine oil

CASE AKCELA UNITEK NO. 1™ SBL CJ-4 SAE 10W-40 is recommended for your engine. This oil insures correct lubrication of your engine in all working conditions. See charts at the beginning of this section to choose the correct oil for climate/temperatures.

If **CASE AKCELA UNITEK NO. 1™ SBL CJ-4 SAE 10W-40** cannot be obtained, use only oil of the API SERVICE CI-4 category.

NOTE: *do not put any Performance Additive or other additive in the sump. Oil change intervals shown in this manual are based on tests carried out utilizing CASE CONSTRUCTION lubricants.*

Grease

The type of grease to use depends on ambient temperature such as **TUTELA MULTI-PURPOSE EP GREASE 251H, GR-9**

Environment

Before you service this machine and dispose of oil, fluids, and lubricants, obey environmental regulations. Do not drain oil or fluids on to the ground or into containers that leak. Check with your local environmental, recycling center or your dealer for correct disposal information.

Engine cooling system

Organicid Acid Tecnology (OAT) coolant

CASE CONSTRUCTION requires the use of a fully formulated Organic Acid Technology (OAT) based coolant. **CASE AKCELA ACTIFULL™ OT EXTENDED LIFE COOLANT** is preferred. The coolant must meet the specifications outlined in the CNH Industrial material specification **MAT3624**. Use of coolant not meeting this specification is not allowed. Mixing of different coolant brands is not recommended.

NOTE: *mix the* ***CASE AKCELA ACTIFULL™ OT EXTENDED LIFE COOLANT*** *with 50% of clean water. Water for dilution of OAT coolant concentrate: distilled or demineralized. If demineralized water is not available, use water for dilution with the following properties:*

Property	Maximum limit
Total Solids	340 ppm
Total Hardness	170 ppm
Chloride (Cl)	40 ppm
Sulfate (SO4)	100 ppm
Acidity pH	5.5 to 9.0

This solution ensures protection of the circuit from **-40.0 °C** (**-40.0 °F**) to **125.0 °C** (**257.0 °F**).

The optimum coolant/water concentration is 50/50. This concentration will protect the cooling system to **-37 °C** (**-35 °F**).If a premixed coolant is not available, mix the concentrate with 50 % of water.The coolant concentration in the coolant/water mixture can be determined with a refractometer designed to measure ethylene glycol content.
Distilled water or deionized water is recommended for the use in the engine cooling systems.
DO NOT use hard water, sea water and softened sea that has been conditioned with salt. The minerals and salts present in potable water can cause corrosion and deposits resulting in shortened engine life.

In the case that the customer may have topped off an OAT coolant system with conventional coolant, follow the “Washing of the cooling system” procedure below to attain the full benefit of the coolant.

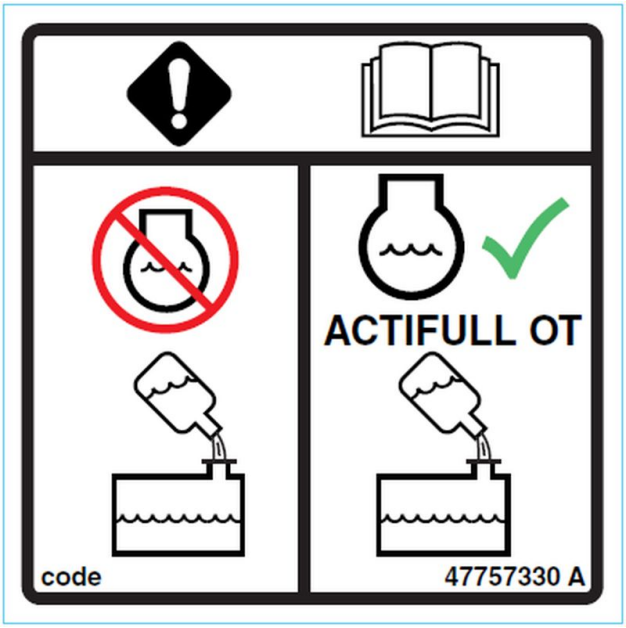
Washing of the cooling system

1. Empty the engine cooling system by draining the coolant into a suitable container.
2. Fill the system with clean water.
3. Start the engine and run the engine for at least **30 min**.

   NOTE: *make sure that you activate the heating system (if equipped) to circulate fluid through the heater core.*
4. Repeat Steps 1 to 3 for a total of two washes.
5. Fill the system with OAT coolant.
6. Operate the engine until it is warm. Inspect the machine for leaks.

You can identify OAT coolant by its yellow color. Also, the decal shown is located near the fill point of the cooling system whenever the factory fill is **CASE AKCELA ACTIFULL™ OT EXTENDED LIFE COOLANT**. This decal is available in three different sizes. See the table below for the associated part numbers.

CNH Industrial part number	Size
47757330	**50 mm** x **50 mm**
47757331	**75 mm** x **75 mm**
47757332	**100 mm** x **100 mm**



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Definitions

Conventional coolant:

A coolant that relies on inorganic inhibitors such as silicates, nitrites, and phosphates for corrosion and cavitation protection.

Organic Acid Technology (OAT) coolant:

A coolant that relies on inhibitors such as organic acid salts (potassium and sodium salts) for corrosion and cavitation protection. The organic salts produce a protective film on the cylinder lines, avoiding cavitation erosion.

Maintenance planning

Maintenance chart

Maintenance action	Check	Grease	Cleaning	Bleed	Replace	Change fluid	Page no.
Every 10 hours							
General inspection	x						7-18
Engine oil level - Check	x						7-20
Hydraulic oil level - Check	x						7-21
Engine coolant level - Check	x						7-22
Every 50 hours							
Grease fittings		x					7-23
Cab air filter - Check and cleaning			x				7-26
Engine air filter - Cleaning			x				7-27
Brake oil level - Check	x						7-29
Front axle oil level - Check	x						7-31
Rear axle oil level - Check	x						7-32
Axles reduction gears oil level - Check	x						7-34
Gearbox oil level – Check	x						7-35
Tires pressure - Check	x						7-37
Wheel nuts tightening - Check	x						7-39
Initial 150 hours							
Front axle oil - Change (initial 150 hours)					x		7-40
Rear axle oil - Change (initial 150 hours)					x		7-41
Axles reduction gears oil - Change (initial 150 hours)					x		7-43
Gearbox oil - Change (initial 150 hours)					x		7-45
Every 250 hours							
Air-conditioning condenser - Cleaning			x				7-47
Compressor drive belt - Check	x						7-48
Every 500 hours							
Engine oil and oil filter - Change					x		7-49
Fuel prefilter - Replace					x		7-52
Fuel filter - Replace					x		7-54
Every 1000 hours							
Air intake lines - Check	x						7-56
Engine coolant - Replace					x		7-57
Hydraulic oil tank - Oil change and cleaning					x		7-60
Hydraulic oil filter - Replace					x		7-62
Cab air filter - Replace					x		7-64
Front axle oil - Change					x		7-65
Rear axle oil - Change					x		7-66
Axles reduction gears oil - Change					x		7-68
Gearbox oil - Change					x		7-70
Battery charge - Check	x						7-72
Every 2000 hours							
Engine air filter - Replace					x		7-73
Engine valve clearance - Check and adjust	x						7-75
Blowby recirculation filter - Replace					x		7-76
Brake oil - Change					x		7-78
Every 3000 hours							
Drive belt - Replace					x		7-79
Fuel tank - Cleaning			x				7-81

Maintenance action	Check	Bleed	Grease	Cleaning	Replace	Change fluid	Page no.
As required							
Radiator - Cleaning				x			**7-83**
Windshield washer fluid level - Check	x						**7-84**
Hydraulic connectors and hoses - Replace					x		**7-85**
Battery - Replace					x		**7-86**
Lights and rotary beacon - Replace					x		**7-88**
Fuses and relays					x		**7-92**

Every 10 hours

General inspection

⚠ WARNING

Improper operation or service of this machine can result in an accident.
Read and understand the SAFETY INFORMATION Section before you perform any maintenance, service, or repairs. Read and understand the specific service procedures for the components you plan to work with before you start servicing the machine.
Failure to comply could result in death or serious injury.

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Every day or every 10 hours, whichever occurs first, before operating the machine, carry out a general inspection on the machine.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.

General

Check visually the machine and working equipment for possible breaks or damages to components or to the machine structure. If repairing operations are required, consult an authorized dealer.
Replace all damaged or worn parts with original spare parts.

Check tires for proper inflation.

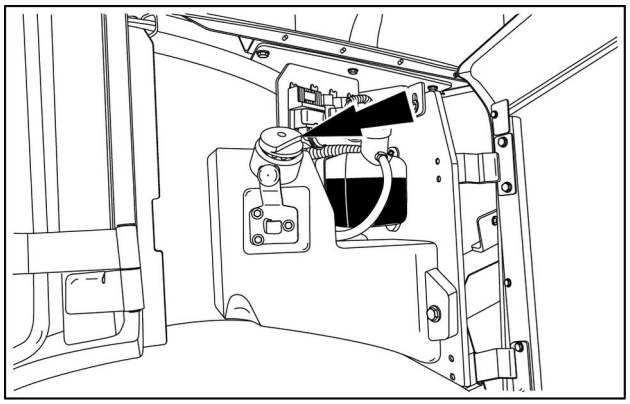
Check that all screws and nuts are correctly tightened.
Check for damage.
Check for leaks and, if present, rectify them.

Wipe off any dust and clean off any accumulated debris (engine, operator's compartment, etc.).

Engine

Check the condition of all lines and all components.

Check the fuel tank level. If necessary, add refuel the fuel tank.



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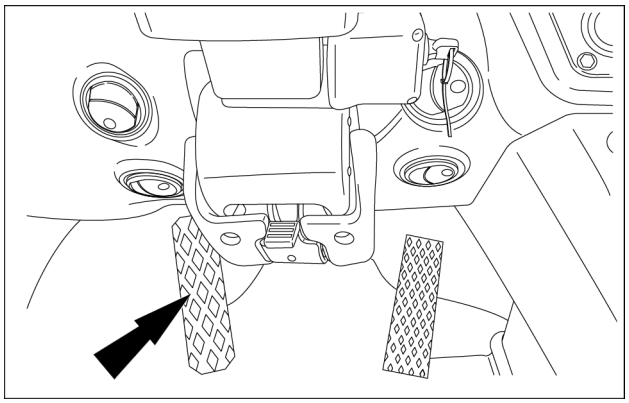
Brakes

Before starting the machine, check the proper operation of the brakes.

Reduce the braking pressure prior to performing any work on the braking system:

- lower the bucket to the ground;
- shut down the engine and remove the ignition key;
- apply the parking brake;
- press the brake pedal 10–15 times.

The braking system is depressurized when the pedal can be pressed without marked resistance.



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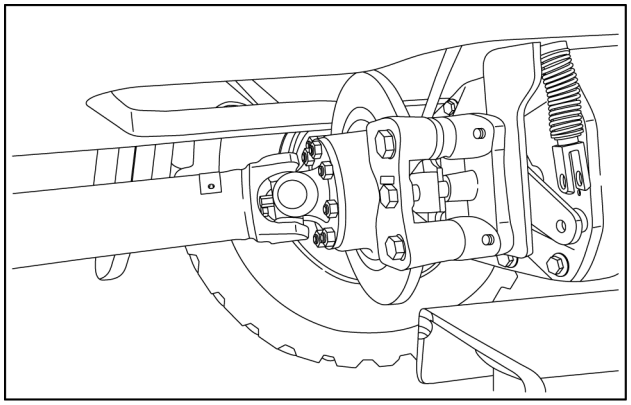
Parking brake

The parking brake requires virtually no maintenance and is applied when the parking brake lever reaches the 6th notch. When the braking efficiency diminishes, check the lining thickness of the brake plates and contact an authorized dealer.



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Lights and rotary beacon

Before operating the machine, clean and check the operation of the rotary beacon and of all lights installed on the machine.

Cab controls and lamps

Before operating the machine, check the correct operation of all controls, instruments, lamps and indicator lamps installed in the operator’s compartment.

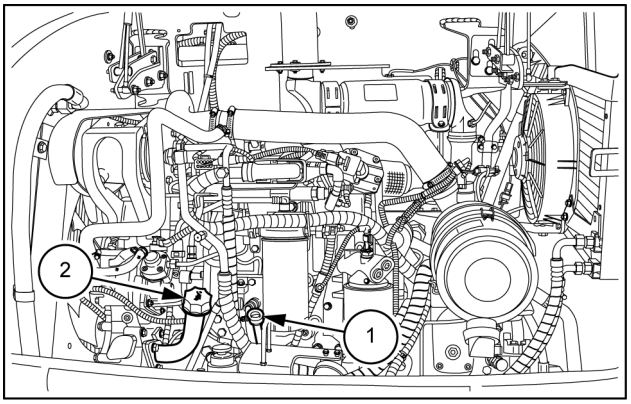
Engine oil level - Check

Check the engine oil level every 10 hour shift or each day, whichever occurs first.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.

Service specifications	
Type of oil	**CASE AKCELA UNITEK NO. 1™ SBL CJ-4 SAE 10W-40**
21F capacity (with filter change)	**7.0 L** (**7.4 US qt**)
121F capacity (with filter change)	**7.0 L** (**7.4 US qt**)
221F capacity (with filter change)	**7.0 L** (**7.4 US qt**)
321F capacity (with filter change)	**7.0 L** (**7.4 US qt**)

1. Open the engine hood and locate the engine oil dipstick **(1)** to the right-hand of the oil fill location **(2)**. Remove the oil dipstick **(1)**. Wipe the dipstick with a clean cloth and reinsert it.



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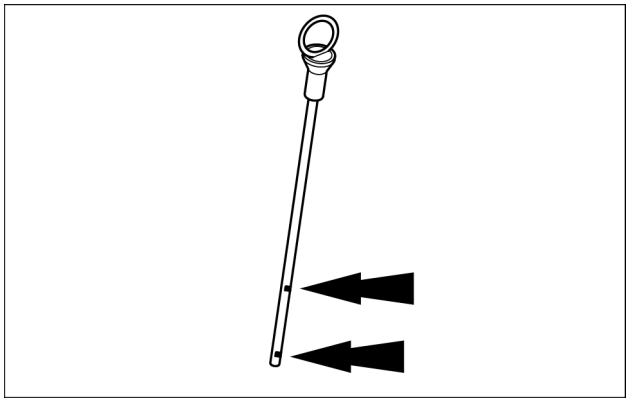
2. Remove the dipstick **(1)** again. The oil level must be between the two marks. If the oil level is close to the “minimum” lower mark, add oil through the oil fill location **(2)**.
   Do not overfill the engine oil.

NOTE: *this procedure is best performed at the beginning of the work day with the engine cool and all oil drained to the pan.*



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Hydraulic oil level - Check

⚠ WARNING

Pressurized hydraulic fluid can penetrate the skin and cause severe injuries.
Hydraulic fluid is under extreme pressure. Rest the bucket or attachment on the ground. Shut the engine off, turn the key on, and move the hydraulic control lever through all movements several times to relieve residual pressure in the system.
Failure to comply could result in death or serious injury.

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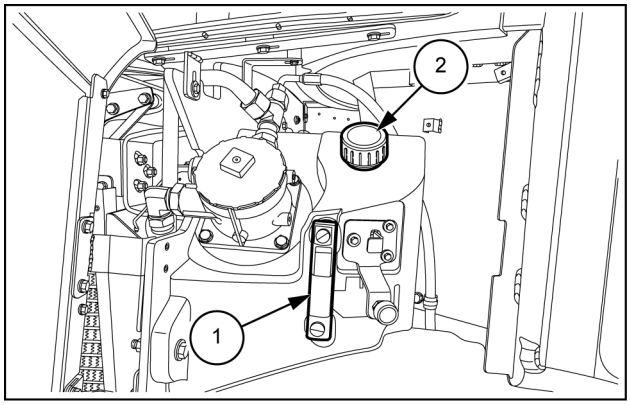
Check the level of the hydraulic oil tank every 10 hours.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.
Relieve residual pressure from the hydraulic system.

Service specifications	
Type of oil	**CASE AKCELA HYDRAULIC EXCAVATOR FLUID**
21F total system capacity	**53 L** (**14 US gal**)
121F total system capacity	**53 L** (**14 US gal**)
221F total system capacity	**53 L** (**14 US gal**)
321F total system capacity	**53 L** (**14 US gal**)

1. Before starting the engine, check the oil level in the sight gauge **(1)** located on the hydraulic oil tank, on the rear right-hand side of the machine.
2. If the oil level is close or under the lower reference mark (red), slowly loosen the tank cap **(2)** and top off until the proper oil level is reached.



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Engine coolant level - Check

⚠ WARNING

Burn hazard!
Hot coolant can spray and scald if you remove the radiator or deaeration tank cap while the system is hot. To remove the cap: allow the system to cool, turn the cap to the first notch, and wait for all pressure to release. Remove the cap only after all pressure has released.
Failure to comply could result in death or serious injury.

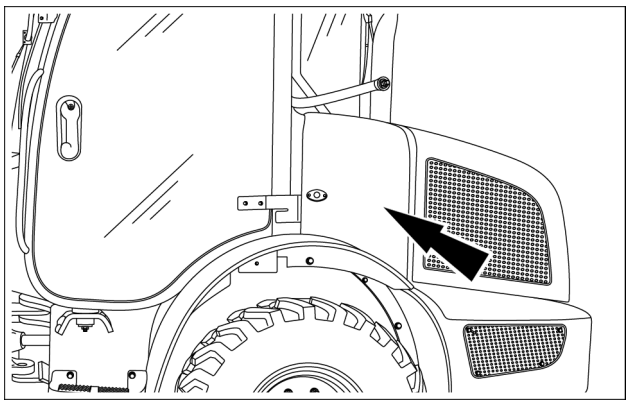
W0367A

Check the engine coolant reservoir level every 10 hours.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.

Service specifications	
Type of coolant	**CASE AKCELA ACTIFULL™ OT EXTENDED LIFE COOLANT**
21F total capacity (50% coolant – 50% water)	**13 L** (**3.4 US gal**)
121F total capacity (50% coolant – 50% water)	**13 L** (**3.4 US gal**)
221F total capacity (50% coolant – 50% water)	**13 L** (**3.4 US gal**)
321F total capacity (50% coolant – 50% water)	**13 L** (**3.4 US gal**)

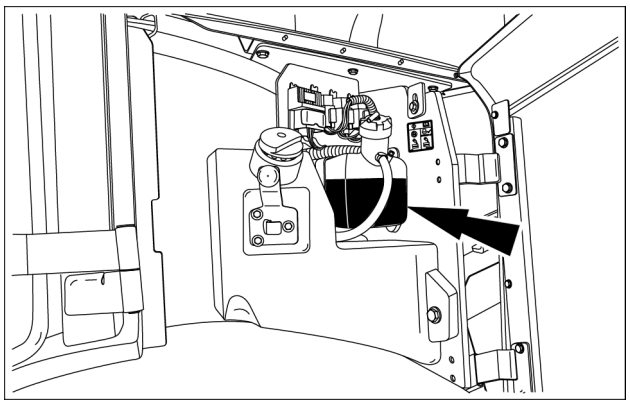
The engine coolant reservoir is located on the left-hand side of the machine, behind the cab.



LEIL14CWL0451AA 1

Check the engine coolant reservoir level every 10 hours of operation. Perform this check when the coolant is cold and the engine is stopped. Do not remove the cap during this check. The coolant level must be between the full and add marks on the reservoir.
Add coolant as required to raise the coolant level to the full mark.

NOTE: *in the event that the system needs topping off make sure to use the proper ratio of water and antifreeze/coolant. Do not overfill.*



LEIL15CWL0089AA 2

Every 50 hours

Grease fittings

⚠ WARNING

Improper operation or service of this machine can result in an accident.
Read and understand the SAFETY INFORMATION Section before you perform any maintenance, service, or repairs. Read and understand the specific service procedures for the components you plan to work with before you start servicing the machine.
Failure to comply could result in death or serious injury.

W0138A

⚠ WARNING

Avoid injury! Always do the following before lubricating, maintaining, or servicing the machine.
1. Disengage all drives.
2. Engage parking brake.
3. Lower all attachments to the ground, or raise and engage all safety locks.
4. Shut off engine.
5. Remove key from key switch.
6. Switch off battery key, if installed.
7. Wait for all machine movement to stop.
Failure to comply could result in death or serious injury.

W0047A

Grease the attachment and machine grease fittings when the hourmeter registers 50 hours of operation or sooner if conditions so require.

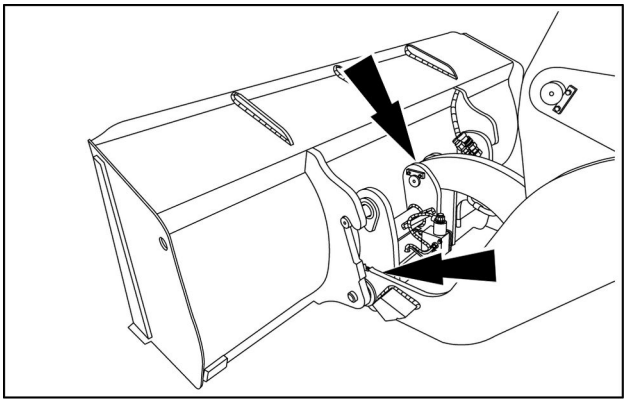
Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.
Make sure all residual pressure is relieved from circuits before beginning maintenance.

Service specifications	
Grease	**TUTELA MULTI-PURPOSE EP GREASE 251H, GR-9**

Clean around the area to be greased before service.

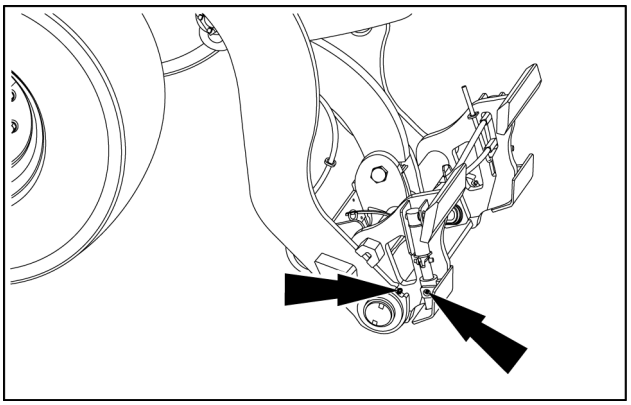
NOTICE: *in severe conditions, such as immersion in water, it may be necessary to reduce the greasing service intervals.*

Bucket/attachment (Horizontal Pin Quick Coupler)



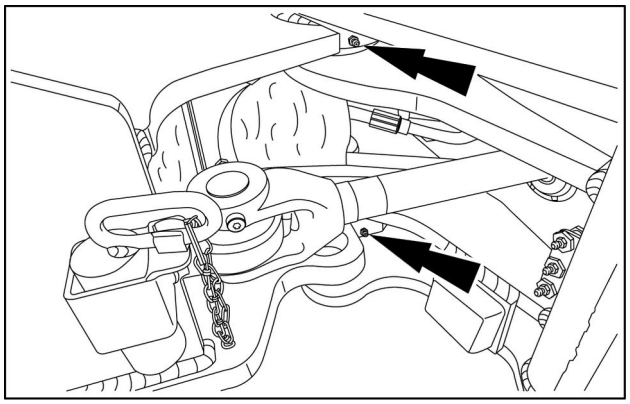
LEIL14CWL0049AA 1

Bucket/attachment (SSL compatible Quick Coupler)



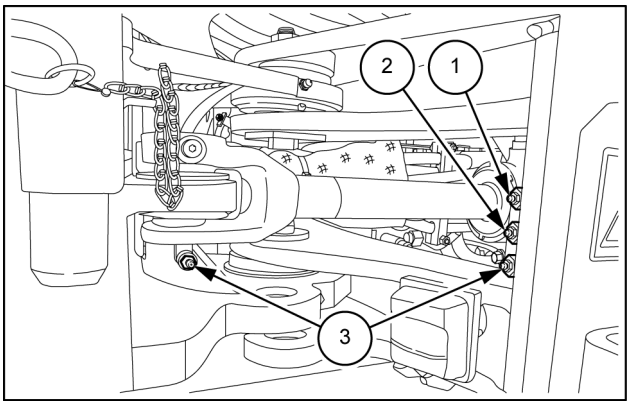
LEIL15CWL0315AB 2

Articulated joints



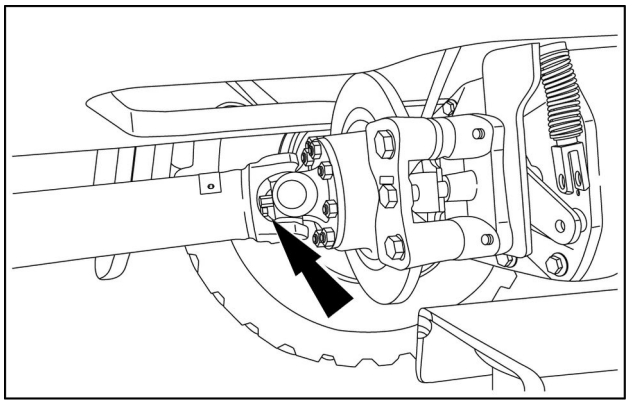
LEIL14CWL0612AA 3

1. Rear axle
2. Rear axle trunnion
3. Steering cylinder (bottom side)



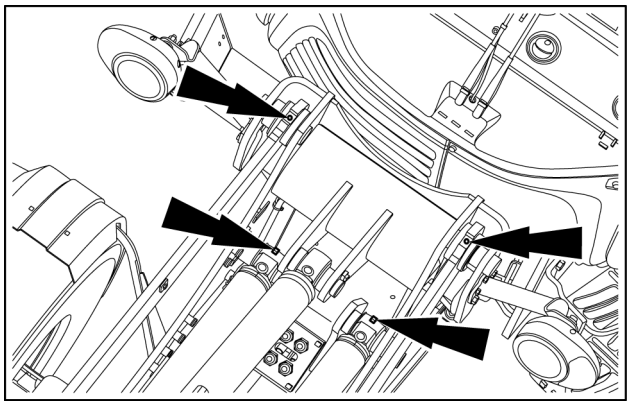
LEIL15CWL0319AB 4

Cardan shaft



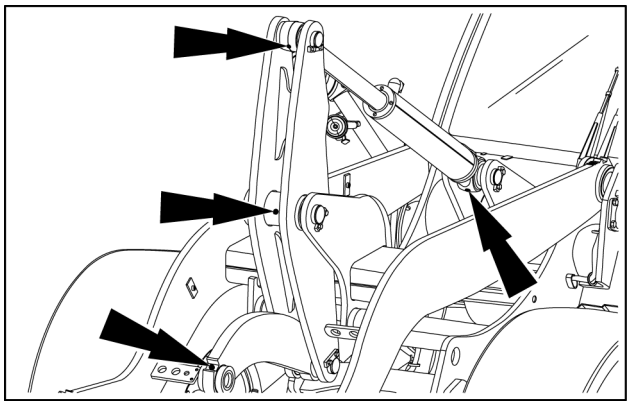
LEIL14CWL0068AA 5

Lift arm and lift cylinders



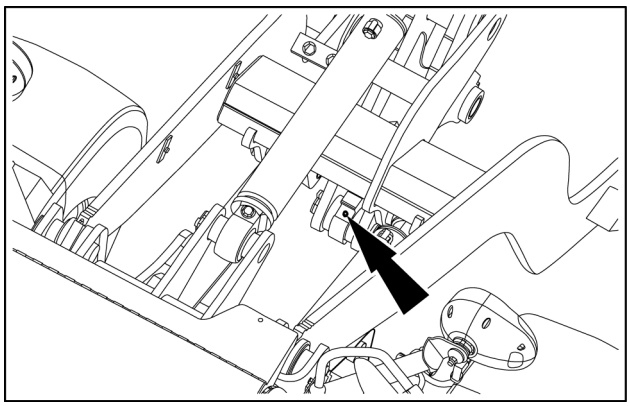
LEIL15CWL0312AB 6

Tilt cylinders, bell crank and dump link



LEIL15CWL0313AB 7

Bell crank



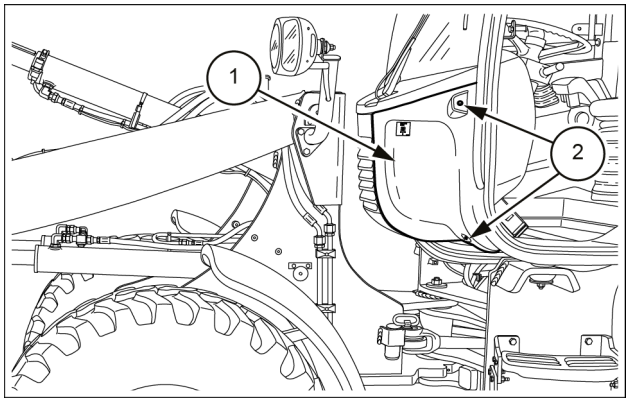
LEIL15CWL0314AB 8

Cab air filter - Check and cleaning

Check and clean the cab air filter when the hourmeter registers 50 hours. Clean the filter every 50 hours thereafter or more frequently when operating in extremely dusty conditions.

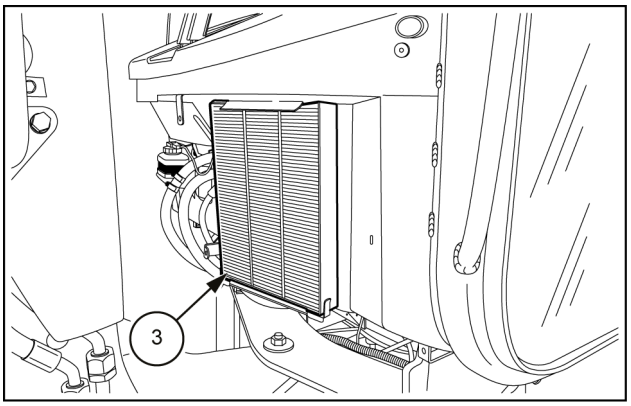
Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.

1. The cab air filter **(3)** is located behind the panel **(1)** fastened to the front side of the external frame of the cab. Remove the retaining screws **(2)** and remove the panel **(1)**.



LEIL15CWL0090AB 1

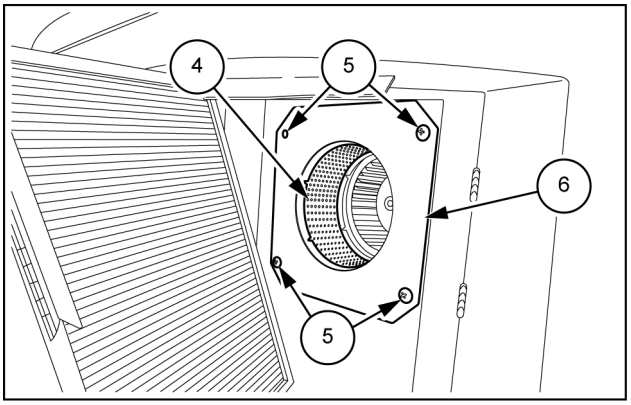
2. Pull the cab air filter **(3)** forward and check for debris or tears. Wipe the filter housing with a damp cloth.
Clean dust from the filter, using compressed air if necessary.



LEIL14CWL0013AB 2

Recirculation air filter

1. The recirculation air filter **(4)** is located behind the cab air filter **(3)**. Remove the screws **(5)**, the filter cover **(6)** and the filter **(4)**.
2. Check the filter for debris or tears. Clean the filter **(4)** using compressed air or replace with a new one.
3. Reinstall the filter **(4)** and use the screws **(5)** to secure the cover plate **(6)**.



LEIL14CWL0014AB 3

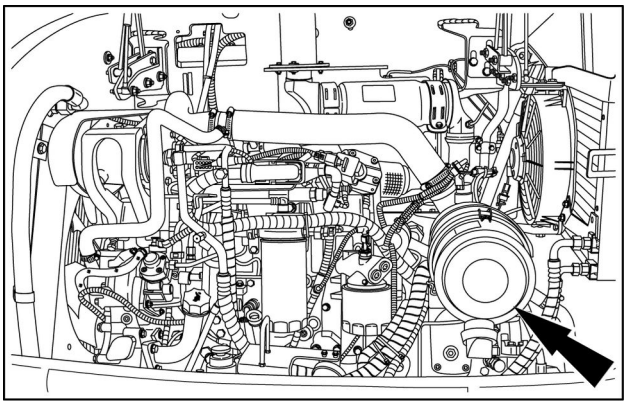
Engine air filter - Cleaning

The air filter should be checked periodically for dirt and debris build up. Clean the engine primary air filter every 50 hours or more frequently if working conditions so require.

The secondary air filter cannot be cleaned, only replaced.

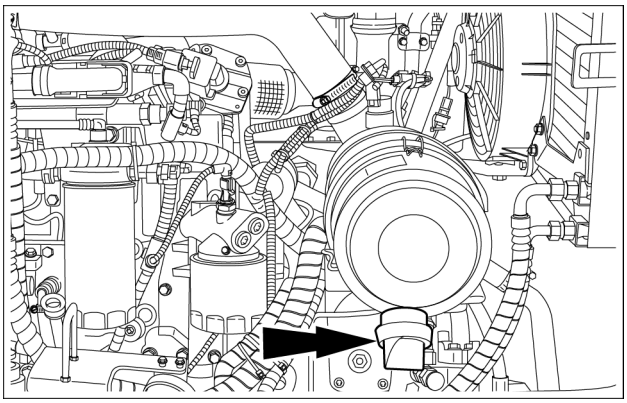
Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.

1. Raise the engine hood and locate the engine air filter in the engine compartment.



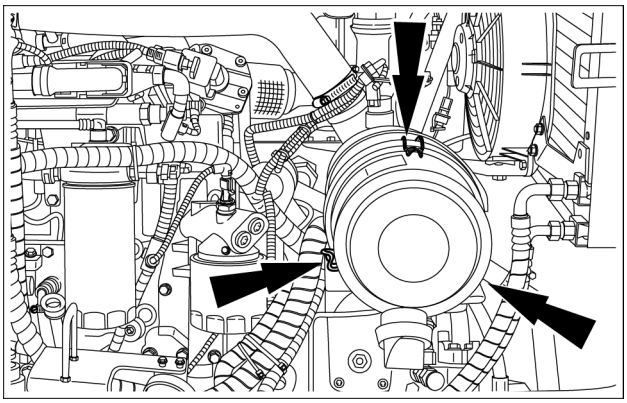
LEIL14CWL0073AA 1

2. Check that the discharge nozzle is not clogged up. If necessary, push on the end of the discharge nozzle to drain dust and debris from the filter housing.



LEIL14CWL0111AB 2

3. Release the three clips and remove the filter cover.

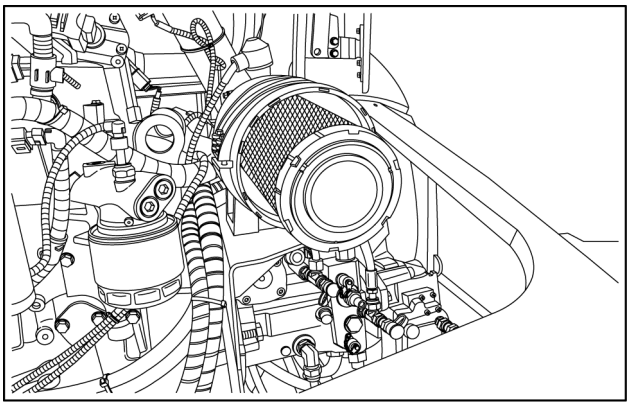


LEIL14CWL0106AB 3

4. Remove the primary air filter.
5. To clean the primary air filter, hold it with the rubber seal facing down. Top all sides of the filter with the hand. Blow the filter out with compressed air: maximum pressure **5 bar** (**72 psi**). Hold the nozzle at a minimum of **7.6 mm** (**0.3 in**) away from the filter. Use a nozzle diameter no smaller than **6.4 mm** (**0.25 in**).

NOTICE: *never use water to clean the engine primary air filter.*

6. Use a light inside the filter to check for damage. If the light shines brightly through the paper, the filter is damaged and must be replaced.
7. Reinstall the primary air filter.
8. Install the cover and lock the clips to secure the cover in place.
9. Close the engine hood.



LEIL14CWL0107AA 4

Brake oil level - Check

⚠ WARNING

Maintenance hazard!
Before performing maintenance on the brake system, chock the traction and steering wheels to prevent machine movement.
Failure to comply could result in death or serious injury.

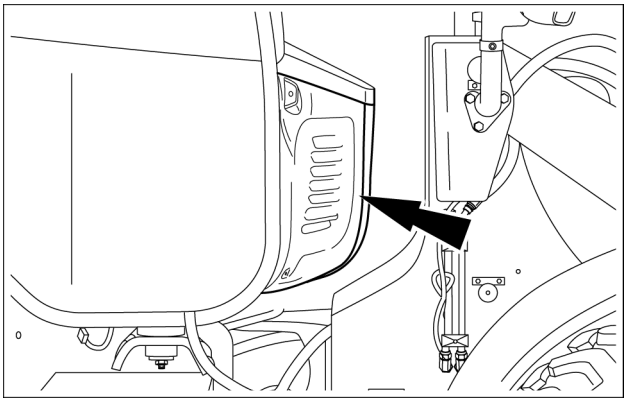
W0064A

Check the brake oil level every 50 hours.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.

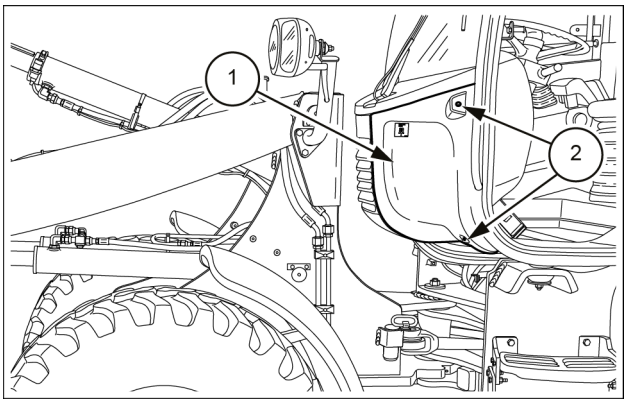
Service specifications	
Type of oil	**CASE AKCELA LHM FLUID**
21F capacity	**1 L** (**1.1 US qt**)
121F capacity	**1 L** (**1.1 US qt**)
221F capacity	**1 L** (**1.1 US qt**)
321F capacity	**1 L** (**1.1 US qt**)

1. The brake oil tank is located behind the panel fastened to the front side of the external frame of the cab, on the right-hand side.



LEIL15CWL0128AB 1

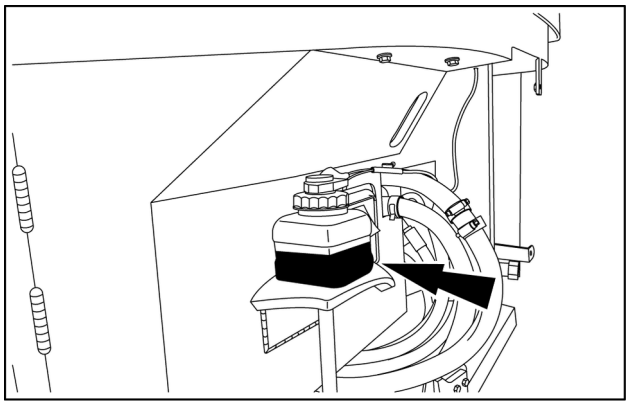
2. Remove the retaining screws **(2)** and remove the panel **(1)** on the left-hand side (on the cab air filter side).
3. Check laterally the brake oil level in the tank from the left-hand side, after the panel **(1)** removal.



LEIL15CWL0090AB 2

4. Check the brake oil level every 50 hours of operation. Perform this check when the engine is stopped. Do not remove the cap during this check. The oil level must be between the full and add marks on the reservoir. If necessary, remove the panel on the right-hand side and add oil.

NOTICE: *if the brake oil level is below the add mark, contact an authorized dealer to check for leaks or fluid deterioration and to check the status of the brake pads.*



LEIL14CWL0482AA 3

Front axle oil level - Check

⚠ WARNING

Chemical hazard!
When handling fuel, lubricants, and other service chemicals, follow the manufacturer's instructions. Wear Personal Protective Equipment (PPE) as instructed. Do not smoke or use open flame. Collect fluids in proper containers. Obey all local and environmental regulations when disposing of chemicals.
Failure to comply could result in death or serious injury.

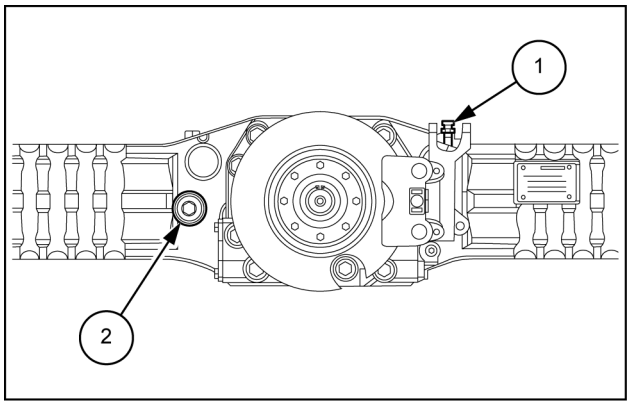
W0371A

Check the oil level in the front axle every 50 hours.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.
Place wheel chocks against the tires to prevent machine movements.

Service specifications	
Type of oil	**CASE AKCELA GEAR 135 H EP LS**
21F–121F front axle	
Differential	**7.5 L** (**2.0 US gal**)
Reduction gear (each side)	**0.7 L** (**0.2 US gal**)
221F–321F front axle	
Differential	**8.0 L** (**2.1 US gal**)
Reduction gear (each side)	**0.7 L** (**0.2 US gal**)

1. Before the oil level check in the front axle, wait 10 minutes until the oil level in the axles is balanced.
2. Activate the breather valve **(1)** to bleed air.
3. Unscrew and remove the filler plug **(2)**. The oil level must be flush with the hole. Add oil if required.
   If necessary, collect the escaping oil and discard properly following the local environmental and waste regulations.
4. Clean and reinstall the filler plug **(2)**.



LEIL14CWL0460AB 1

5. After 10 minutes, repeat the oil level check. If necessary, add oil again.

Rear axle oil level - Check

⚠ WARNING

Chemical hazard!
When handling fuel, lubricants, and other service chemicals, follow the manufacturer's instructions. Wear Personal Protective Equipment (PPE) as instructed. Do not smoke or use open flame. Collect fluids in proper containers. Obey all local and environmental regulations when disposing of chemicals.
Failure to comply could result in death or serious injury.

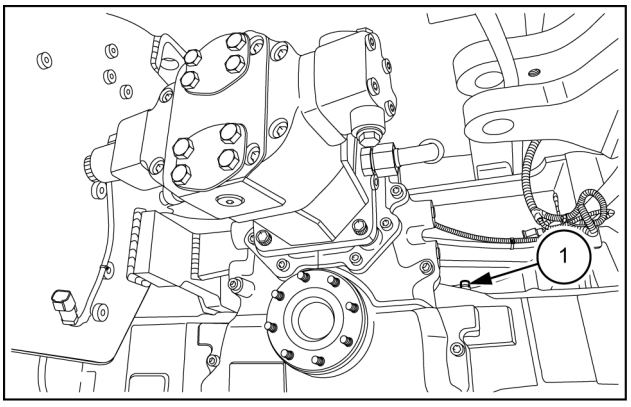
W0371A

Check the oil level in the rear axle every 50 hours.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.
Place wheel chocks against the tires to prevent machine movements.

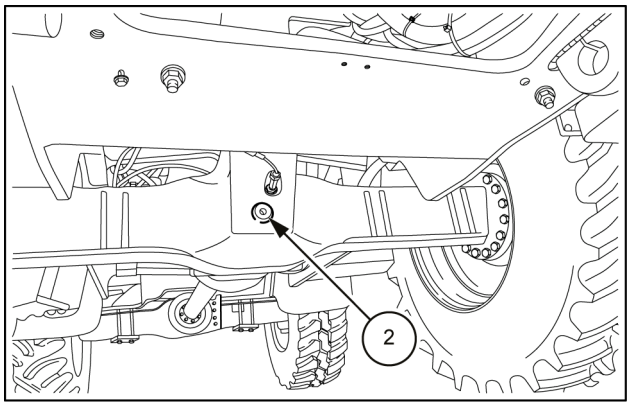
Service specifications	
Type of oil	**CASE AKCELA GEAR 135 H EP LS**
21F–121F rear axle	
Differential	**7.5 L** (**2.0 US gal**)
Reduction gear (each side)	**0.7 L** (**0.2 US gal**)
Gearbox	**1.3 L** (**0.3 US gal**)
221F–321F (standard models) rear axle	
Differential	**8.0 L** (**2.1 US gal**)
Reduction gear (each side)	**0.7 L** (**0.2 US gal**)
Gearbox	**1.3 L** (**0.3 US gal**)
221F–321F (“High Speed” models) rear axle	
Differential	**8.0 L** (**2.1 US gal**)
Reduction gear (each side)	**0.7 L** (**0.2 US gal**)
Gearbox	**0.75 L** (**0.2 US gal**)

1. Before the oil level check in the rear axle, wait 10 minutes until the oil level in the axles is balanced.
2. Activate the breather valve **(1)** to bleed air.



LEIL14CWL0461AB 1

3. Unscrew and remove the filler plug **(2)**. The oil level must be flush with the hole. Add oil if required.
   If necessary, collect the escaping oil and discard properly following the local environmental and waste regulations.
4. Clean and reinstall the filler plug **(2)**.
5. After 10 minutes, repeat the oil level check. If necessary, add oil again.



LEIL14CWL0462AB 2

Axles reduction gears oil level - Check

⚠ WARNING

Chemical hazard!
When handling fuel, lubricants, and other service chemicals, follow the manufacturer's instructions. Wear Personal Protective Equipment (PPE) as instructed. Do not smoke or use open flame. Collect fluids in proper containers. Obey all local and environmental regulations when disposing of chemicals.
Failure to comply could result in death or serious injury.

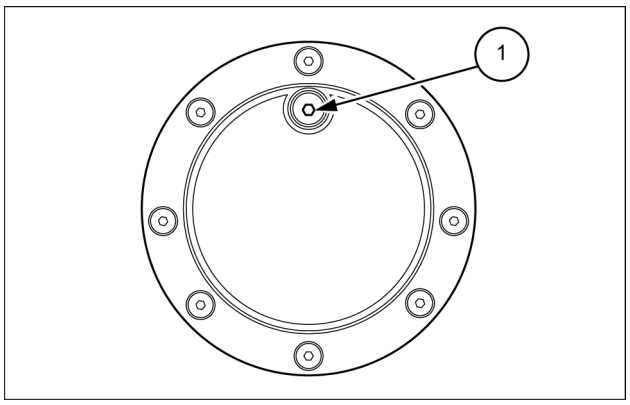
W0371A

Check the oil level in the axles reduction gears every 50 hours.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.

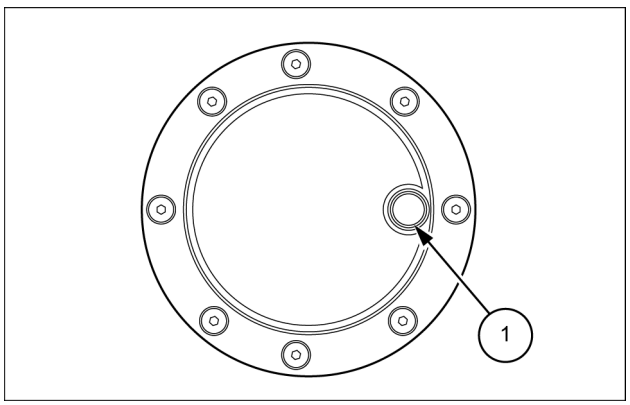
Service specifications	
Type of oil	**CASE AKCELA GEAR 135 H EP LS**
21F–121F front axle and rear axle	
Reduction gear (each side)	**0.7 L** (**0.2 US gal**)
221F–321F front axle and rear axle	
Reduction gear (each side)	**0.7 L** (**0.2 US gal**)

1. Rotate the wheel end so that the plug **(1)** is at the highest position.
   Partially unscrew the plug **(1)** to release possible pressure.



LEIL14CWL0495AB 1

2. Rotate the wheel end so that the hole **(1)** is in the horizontal position.
3. Unscrew the plug **(1)**. The oil level must be flush with the hole. If necessary, fill in new oil until oil comes out of the hole **(1)**.
4. Clean and retighten the plug **(1)**.



LEIL14CWL0497AB 2

5. After 10 minutes, repeat the oil level check. If necessary, add oil again.

Gearbox oil level – Check

⚠ WARNING

Chemical hazard!
When handling fuel, lubricants, and other service chemicals, follow the manufacturer's instructions. Wear Personal Protective Equipment (PPE) as instructed. Do not smoke or use open flame. Collect fluids in proper containers. Obey all local and environmental regulations when disposing of chemicals.
Failure to comply could result in death or serious injury.

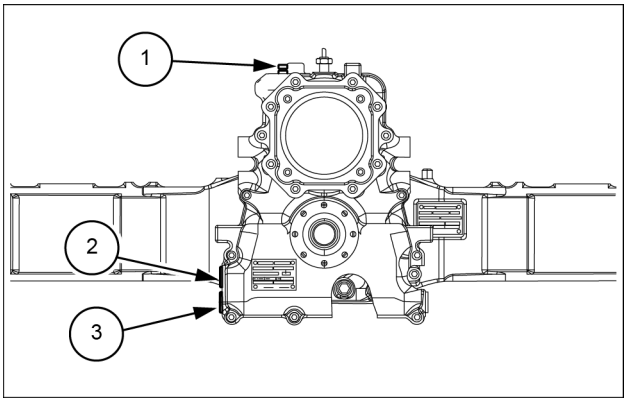
W0371A

Check the oil level in the gearbox every 50 hours.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.
Place wheel chocks against the tires to prevent machine movements.

Service specifications	
Type of oil	**CASE AKCELA GEAR 135 H EP LS**
21F–121F rear axle	
Gearbox	**1.3 L (0.3 US gal)**
221F–321F (standard models) rear axle	
Gearbox	**1.3 L (0.3 US gal)**
221F–321F (“High Speed” models) rear axle	
Gearbox	**0.75 L (0.2 US gal)**

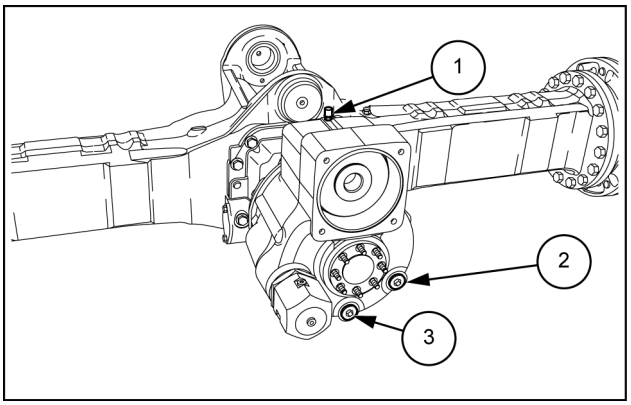
1. Locate the filler plug **(2)** and the drain plug **(3)** on the right-hand side of the gearbox.
2. Activate the breather valve **(1)** of the gearbox to bleed air.
3. Clean the area around the filler plug **(2)** of the gearbox.
4. Unscrew and remove the filler plug **(2)**. The oil level must be flush with the hole. Add oil if required.
   If necessary, collect the escaping oil and discard properly following the local environmental and waste regulations.
5. Clean and reinstall the filler plug **(2)**.
6. After 10 minutes, repeat the oil level check. If necessary, add oil again.



LEIL14CWL0642AB 1

“High Speed” models

1. Locate the filler plug **(2)** and the drain plug **(3)** on the front side of the gearbox.
2. Activate the breather valve **(1)** of the gearbox to bleed air.
3. Clean the area around the filler plug **(2)** of the gearbox.
4. Unscrew and remove the filler plug **(2)**. The oil level must be flush with the hole. Add oil if required.
   If necessary, collect the escaping oil and discard properly following the local environmental and waste regulations.
5. Clean and reinstall the filler plug **(2)**.
6. After 10 minutes, repeat the oil level check. If necessary, add oil again.



LEIL15CWL0086AB 2

Tires pressure - Check

⚠ WARNING

Explosion hazard!
When inflating tires, use a clip-on air chuck with a gauge, remote valve, and hose long enough to allow you to stand to one side and NOT in front of or over the wheel assembly. Keep others out of the DANGER AREA. Never inflate a tire beyond the maximum allowable pressure printed on the tire.
Failure to comply could result in death or serious injury.

W0059A

⚠ WARNING

Explosion hazard!
Never weld on a wheel. Welding can cause stresses that will cause a wheel to crack or break unexpectedly. Tires can separate explosively during welding. Always have a qualified tire mechanic service wheels and tires.
Failure to comply could result in death or serious injury.

W0124A

Check the tires pressure every 50 hours. A burst tire can cause serious injury. Check the tires condition and always observe the inflation pressures defined in accordance with the type of tire and ground concerned.

Always have a qualified tire technician service the tires and rims for this machine. It is recommended that this technician inflates the tires. To prevent accidents, use a restraining device (tire inflation cage), correct equipment and correct procedure. Explosive separation of the tire (single piece rim) or the tire and/or rim parts (multi-piece rim) can cause serious injury or death.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.

Tires pressure check

- When checking tires pressure, never stay facing the tire but always facing the tread surface. Always use an inflation cage when the wheel is removed from the machine. Keep all other personnel away from the area
- Before inflating the tires, check the tires, rims and rim parts for damage, penetrated foreign objects and proper fitting.
- Check the tires pressure only with cold tires; when tires are warm, the pressure values detected are higher.
- Use inflation equipment with long filling hose, self-locking nozzle and pressure gauge.
  Attach the self-locking nozzle of the inflating equipment to the tire filling valve. The device is equipped with a pressure gauge, that when connected, allows to check the pressure value.
  If the tire pressure results lower than the prescribed value, inflate the tire.

Tire inflation

To inflate a tire

1. Use an air hose with a remote shutoff valve and a self-locking air chuck. Put the tire in a restraining cage.
2. Stand BEHIND the tread of the tire and make sure ALL personnel are away from the side of the tire before you start.
3. Inflate the tire to the recommended air pressure. DO NOT inflate the tire more than the recommended pressure.

21F tire type	Front pressure	Rear pressure
12.5-18	**3.5 bar (50.7 psi)**	**3.5 bar (50.7 psi)**
335/80 R18	**3.5 bar (50.7 psi)**	**3.5 bar (50.7 psi)**
365/70 R18	**3.5 bar (50.7 psi)**	**3.5 bar (50.7 psi)**
12.5-20	**3.5 bar (50.7 psi)**	**3.5 bar (50.7 psi)**
340/80 R18**	**3.5 bar (50.7 psi)**	**3.5 bar (50.7 psi)**

121F tire type	Front pressure	Rear pressure
12.5-18	**3.5 bar (50.7 psi)**	**3.5 bar (50.7 psi)**
335/80 R18	**3.5 bar (50.7 psi)**	**3.5 bar (50.7 psi)**
365/70 R18	**3.5 bar (50.7 psi)**	**3.5 bar (50.7 psi)**
12.5-20	**3.5 bar (50.7 psi)**	**3.5 bar (50.7 psi)**
340/80 R18**	**3.5 bar (50.7 psi)**	**3.5 bar (50.7 psi)**

221F tire type	Front pressure	Rear pressure
365/70 R18	**3.5 bar (50.7 psi)**	**3.5 bar (50.7 psi)**
12.5-20	**3.5 bar (50.7 psi)**	**3.5 bar (50.7 psi)**
14.5-40	**3.5 bar (50.7 psi)**	**3.5 bar (50.7 psi)**
360/80 R20*	**3.2 bar (46.4 psi)**	**3.2 bar (46.4 psi)**
365/80 R20	**3.5 bar (50.7 psi)**	**3.5 bar (50.7 psi)**
405/70 R20	**3.5 bar (50.7 psi)**	**3.5 bar (50.7 psi)**
400/70 R20**	**3.5 bar (50.7 psi)**	**3.5 bar (50.7 psi)**

321F tire type	Front pressure	Rear pressure
14.5-40	**3.5 bar (50.7 psi)**	**3.5 bar (50.7 psi)**
360/80 R20*	**3.2 bar (46.4 psi)**	**3.2 bar (46.4 psi)**
365/80 R20	**3.5 bar (50.7 psi)**	**3.5 bar (50.7 psi)**
405/70 R20	**3.5 bar (50.7 psi)**	**3.5 bar (50.7 psi)**
400/70 R20**	**3.5 bar (50.7 psi)**	**3.5 bar (50.7 psi)**

* snow tires
** Agriculture tires

Wheel nuts tightening - Check

⚠ WARNING

Explosion hazard!
Never weld on a wheel. Welding can cause stresses that will cause a wheel to crack or break unexpectedly. Tires can separate explosively during welding. Always have a qualified tire mechanic service wheels and tires.
Failure to comply could result in death or serious injury.

W0124A

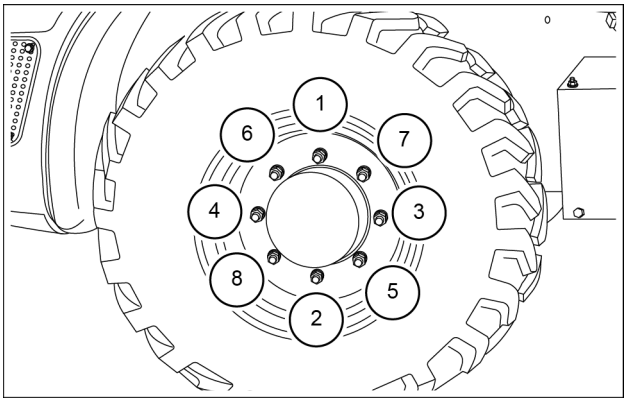
Check the nuts tightening of the wheels every 50 hours.

Always have a qualified tire technician service the tires and rims for this machine. To prevent accidents, use a correct equipment, and correct procedure. Explosive separation of the tire (single piece rim) or the tire and / or rim parts (multi-piece rim) can cause serious injury or death.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.
Place wheel chocks against the tires to prevent machine movements.

1. Check the nuts tightening for each wheel.
2. If necessary, tighten the wheel nuts to the required torque.
   Use a torque wrench to tighten the wheel nuts to the required torque. Tighten the wheel nuts with cross path, as shown in the figure.
   Tightening torque: **500.0 N·m** (**368.8 lb ft**)

NOTICE: *do not use an air impact wrench to tighten the nuts to the final torque.*



LEIL14CWL0491AB 1

Initial 150 hours

Front axle oil - Change (initial 150 hours)

⚠ WARNING

Chemical hazard!
When handling fuel, lubricants, and other service chemicals, follow the manufacturer's instructions. Wear Personal Protective Equipment (PPE) as instructed. Do not smoke or use open flame. Collect fluids in proper containers. Obey all local and environmental regulations when disposing of chemicals.
Failure to comply could result in death or serious injury.

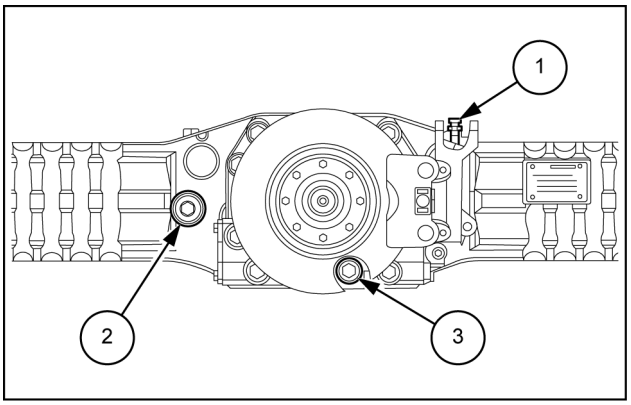
W0371A

Carry out a first drain and change of the front axle oil when the hourmeter registers the initial 150 hours. The front axle oil must be changed every 1000 hours thereafter or more frequently if conditions so require.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.
Place wheel chocks against the tires to prevent machine movements.

Service specifications	
Type of oil	**CASE AKCELA GEAR 135 H EP LS**
21F–121F front axle	
Differential	**7.5 L** (**2.0 US gal**)
Reduction gear (each side)	**0.7 L** (**0.2 US gal**)
221F–321F front axle	
Differential	**8.0 L** (**2.1 US gal**)
Reduction gear (each side)	**0.7 L** (**0.2 US gal**)

1. Clean the area around the filler plug **(2)** and drain plug **(3)** of the front axle.
2. Activate the breather valve **(1)** to bleed air.
3. Place a suitable container with sufficient capacity to capture the old oil under the front axle and drain. Unscrew the drain plug **(3)** and allow oil to drain. Collect the escaping oil and discard properly following the local environmental and waste regulations.
4. After complete draining, clean and reinstall the drain plug **(3)**.
5. Unscrew and remove the filler plug **(2)**. Add oil. The oil level must be flush with the hole.
6. Clean and reinstall the filler plug **(2)**.



LEIL14CWL0463AB 1

Rear axle oil - Change (initial 150 hours)

⚠ WARNING

Chemical hazard!
When handling fuel, lubricants, and other service chemicals, follow the manufacturer's instructions. Wear Personal Protective Equipment (PPE) as instructed. Do not smoke or use open flame. Collect fluids in proper containers. Obey all local and environmental regulations when disposing of chemicals.
Failure to comply could result in death or serious injury.

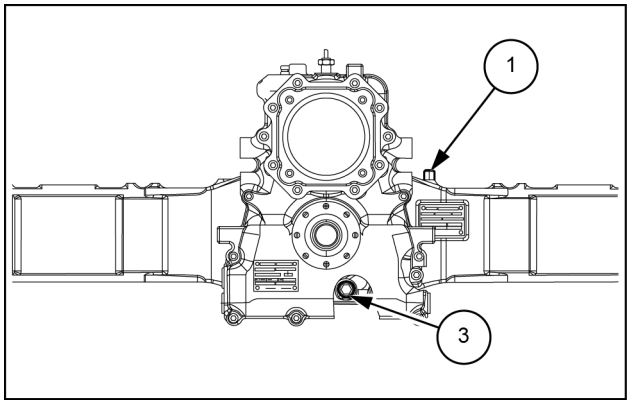
W0371A

Carry out a first drain and change of the rear axle oil when the hourmeter registers the initial 150 hours. The rear axle oil must be changed every 1000 hours thereafter or more frequently if conditions so require.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.
Place wheel chocks against the tires to prevent machine movements.

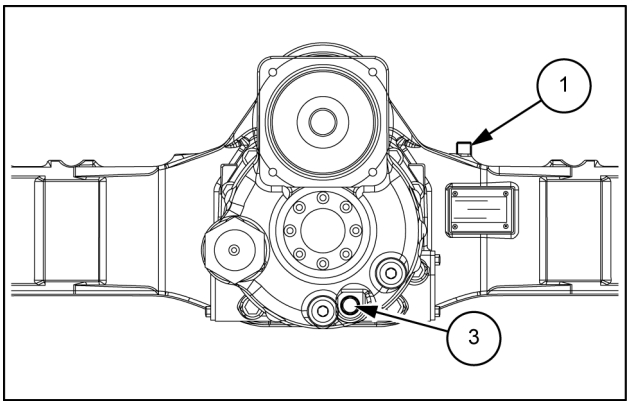
Service specifications	
Type of oil	**CASE AKCELA GEAR 135 H EP LS**
21F–121F rear axle	
Differential	**7.5 L** (**2.0 US gal**)
Reduction gear (each side)	**0.7 L** (**0.2 US gal**)
Gearbox	**1.3 L** (**0.3 US gal**)
221F–321F (standard models) rear axle	
Differential	**8.0 L** (**2.1 US gal**)
Reduction gear (each side)	**0.7 L** (**0.2 US gal**)
Gearbox	**1.3 L** (**0.3 US gal**)
221F–321F (“High Speed” models) rear axle	
Differential	**8.0 L** (**2.1 US gal**)
Reduction gear (each side)	**0.7 L** (**0.2 US gal**)
Gearbox	**0.75 L** (**0.2 US gal**)

1. Clean around the area of the drain plug **(3)** of the rear axle.
2. Activate the breather valve **(1)** to bleed air.
3. Place a suitable container with sufficient capacity to capture the old oil under the rear axle and drain. Unscrew the drain plug **(3)** and allow oil to drain. Collect the escaping oil and discard properly following the local environmental and waste regulations.
4. After complete draining, clean and reinstall the drain plug **(3)**.



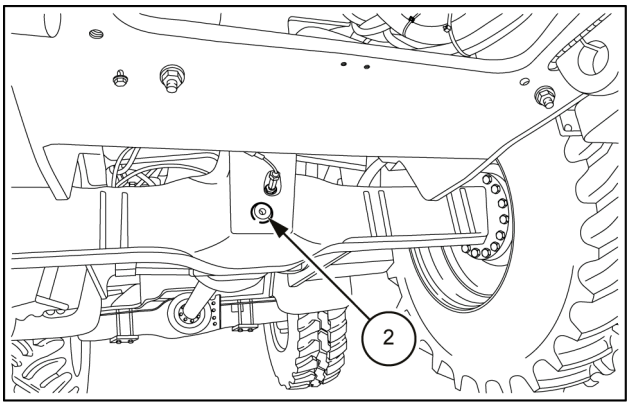
LEIL14CWL0464AB 1

NOTE: *the figure beside shows the layout of the breather valve* ***(1)*** *and drain plug* ***(3)*** *for the "High Speed" models rear axle.*



LEIL15CWL0085AB 2

5. Clean the area around the filler plug **(2)** of the rear axle.
6. Unscrew and remove the filler plug **(2)**.
   Add oil. The oil level must be flush with the hole.
7. Clean and reinstall the filler plug **(2)**.



LEIL14CWL0462AB 3

Axles reduction gears oil - Change (initial 150 hours)

⚠ WARNING

Chemical hazard!
When handling fuel, lubricants, and other service chemicals, follow the manufacturer's instructions. Wear Personal Protective Equipment (PPE) as instructed. Do not smoke or use open flame. Collect fluids in proper containers. Obey all local and environmental regulations when disposing of chemicals.
Failure to comply could result in death or serious injury.

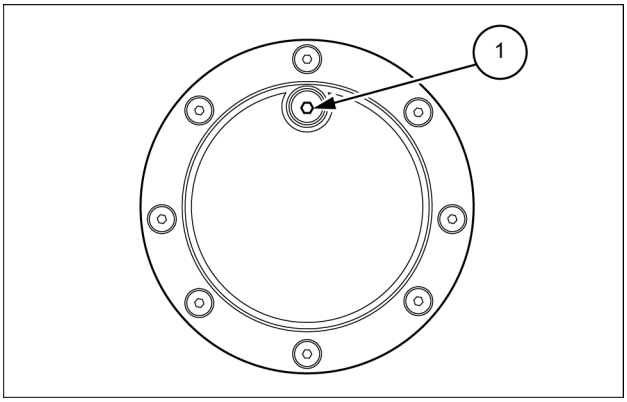
W0371A

Carry out a first change of the axles reduction gears oil when the hourmeter registers the initial 150 hours. The axles reduction gears oil must be changed every 1000 hours thereafter or more frequently if conditions so require.
To drain and fill the oil and to check the oil level in the reduction gear, the axle must be horizontal.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.

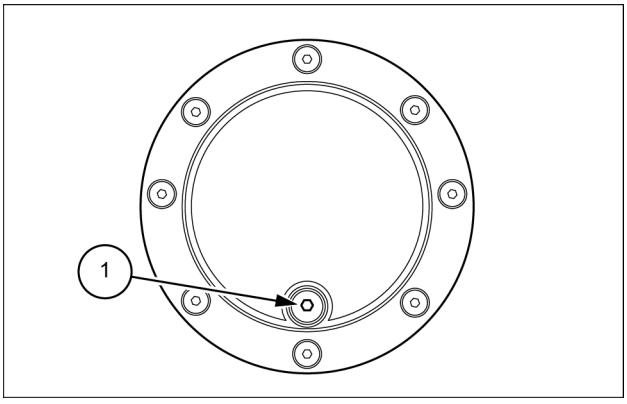
Service specifications	
Type of oil	**CASE AKCELA GEAR 135 H EP LS**
21F–121F front axle and rear axle	
Reduction gear (each side)	**0.7 L** (**0.2 US gal**)
221F–321F front axle and rear axle	
Reduction gear (each side)	**0.7 L** (**0.2 US gal**)

1. Rotate the wheel end so that the plug **(1)** is at the highest position.
   Partially unscrew the plug **(1)** to release possible pressure.



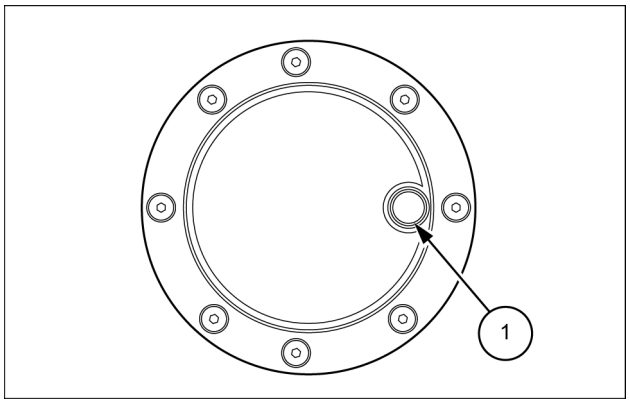
LEIL14CWL0495AB 1

2. Rotate the wheel end so that the plug **(1)** is toward the ground. Remove the plug **(1)** and drain the oil.
   Collect the escaping oil and discard properly following the local environmental and waste regulations.



LEIL14CWL0496AB 2

3. Rotate the wheel end so that the hole **(1)** is in the horizontal position.
4. Add oil in the hole **(1)**. The oil level must be flush with the hole **(1)**, so fill in new oil until oil comes out of the hole **(1)**.
5. Clean and retighten the plug **(1)**.



LEIL14CWL0497AB 3

Gearbox oil - Change (initial 150 hours)

⚠ WARNING

Chemical hazard!
When handling fuel, lubricants, and other service chemicals, follow the manufacturer's instructions. Wear Personal Protective Equipment (PPE) as instructed. Do not smoke or use open flame. Collect fluids in proper containers. Obey all local and environmental regulations when disposing of chemicals.
Failure to comply could result in death or serious injury.

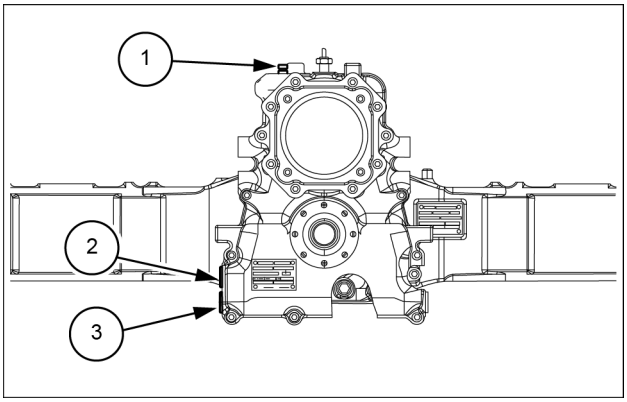
W0371A

Carry out a first drain and change of the gearbox oil when the hourmeter registers the initial 150 hours. The gearbox oil must be changed every 1000 hours thereafter or more frequently if conditions so require.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.
Place wheel chocks against the tires to prevent machine movements.

Service specifications	
Type of oil	**CASE AKCELA GEAR 135 H EP LS**
21F–121F rear axle	
Gearbox	**1.3 L** (**0.3 US gal**)
221F–321F (standard models) rear axle	
Gearbox	**1.3 L** (**0.3 US gal**)
221F–321F (“High Speed” models) rear axle	
Gearbox	**0.75 L** (**0.2 US gal**)

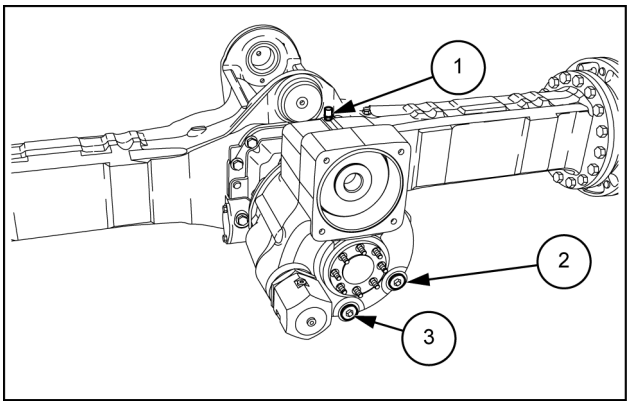
1. Locate the filler plug **(2)** and the drain plug **(3)** on the right-hand side of the gearbox.
2. Clean around the area of the drain plug **(3)** of the gearbox.
3. Activate the breather valve **(1)** of the gearbox to bleed air.
4. Place a suitable container with sufficient capacity to capture the old oil under the gearbox and drain. Unscrew the drain plug **(3)** and allow oil to drain. Collect the escaping oil and discard properly following the local environmental and waste regulations.
5. After complete draining, clean and reinstall the drain plug **(3)**.
6. Clean the area around the filler plug **(2)** of the gearbox.
7. Unscrew and remove the filler plug **(2)**. Add oil. The oil level must be flush with the hole.
8. Clean and reinstall the filler plug **(2)**.



LEIL14CWL0642AB 1

“High Speed” models

1. Locate the filler plug **(2)** and the drain plug **(3)** on the front side of the gearbox.
2. Clean around the area of the drain plug **(3)** of the gearbox.
3. Activate the breather valve **(1)** of the gearbox to bleed air.
4. Place a suitable container with sufficient capacity to capture the old oil under the gearbox and drain. Unscrew the drain plug **(3)** and allow oil to drain. Collect the escaping oil and discard properly following the local environmental and waste regulations.
5. After complete draining, clean and reinstall the drain plug **(3)**.
6. Clean the area around the filler plug **(2)** of the gearbox.
7. Unscrew and remove the filler plug **(2)**. Add oil. The oil level must be flush with the hole.
8. Clean and reinstall the filler plug **(2)**.



LEIL15CWL0086AB 2

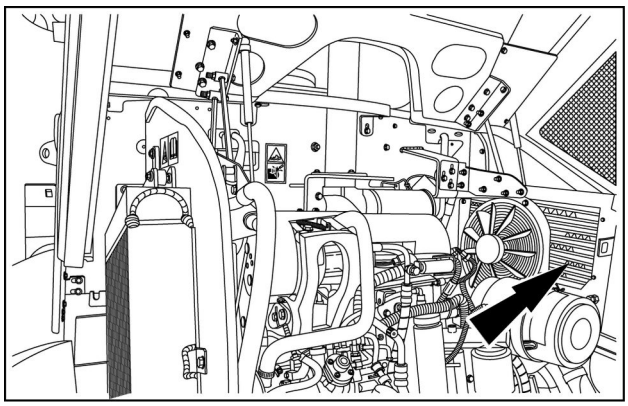
Every 250 hours

Air-conditioning condenser - Cleaning

Clean the air-conditioning condenser every 250 hours or more frequently if working conditions so require. A contaminated condenser has a bad condensing performance

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.

1. Open the engine hood. The air-conditioning condenser is located on the right-hand side of the engine compartment.
2. Blow out or wash with water to clean the condenser. Do not use high-pressure jet cleaners. Do not to bend or to damage the fins during the cleaning operation.



LEIL14CWL0033AA 1

Compressor drive belt - Check

⚠ WARNING

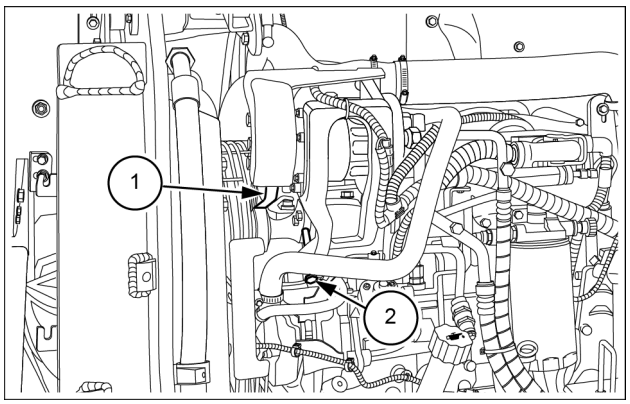
Entanglement hazard!
Always stop the engine and engage the parking brake, unless otherwise instructed in this manual, before checking and/or adjusting any drive belt or chain.
Failure to comply could result in death or serious injury.

W0097A

Check the air-conditioning compressor drive belt every 250 hours.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.

1. The compressor drive belt **(1)** is located in the engine compartment, on the left-hand side.
   Carry out a visual check of the compressor drive belt **(1)** for fraying, cracks and damage.
   If necessary, replace the compressor drive belt **(1)** through your dealer.
2. Check the tension of the compressor drive belt **(1)**.
   If the tension is not correct, loosen the locknut of the screw **(2)**, then loosen or tighten the screw **(2)** until the compressor drive belt **(1)** reaches the correct tension.
   Drive belt tension: **400 – 489 N** (**89.9 – 109.9 lb**)



LEIL14CWL0489AB 1

Every 500 hours

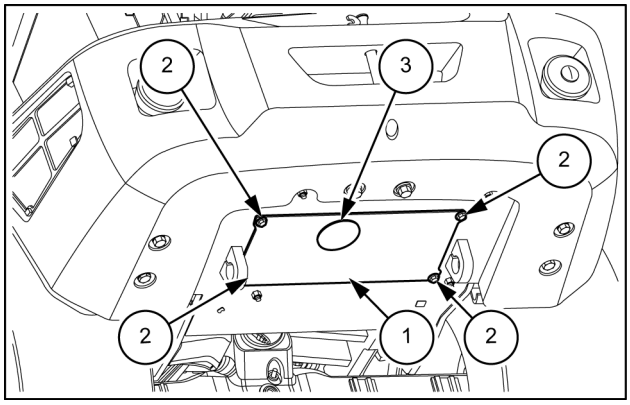
Engine oil and oil filter - Change

Change the engine oil and the oil filter when the hourmeter registers 500 hours or more frequently when the engine operating conditions are severe.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.

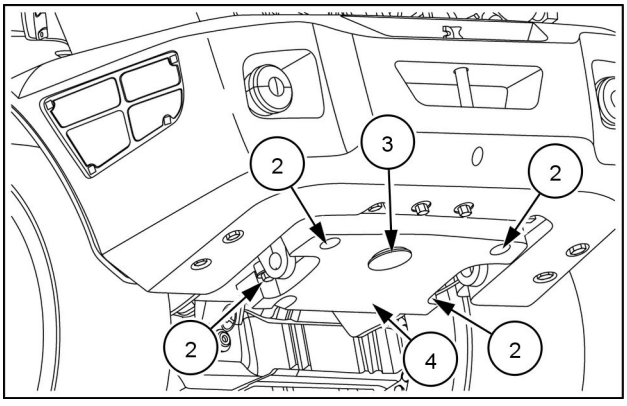
Service specifications	
Type of oil	**CASE AKCELA UNITEK NO. 1™ SBL CJ-4 SAE 10W-40**
21F Capacity (with filter change)	**7.0 L** (**7.4 US qt**)
121F Capacity (with filter change)	**7.0 L** (**7.4 US qt**)
221F Capacity (with filter change)	**7.0 L** (**7.4 US qt**)
321F Capacity (with filter change)	**7.0 L** (**7.4 US qt**)

1. To access the engine oil drain plug, remove the four screws **(2)** and remove the plate **(1)** with the plug **(3)**.



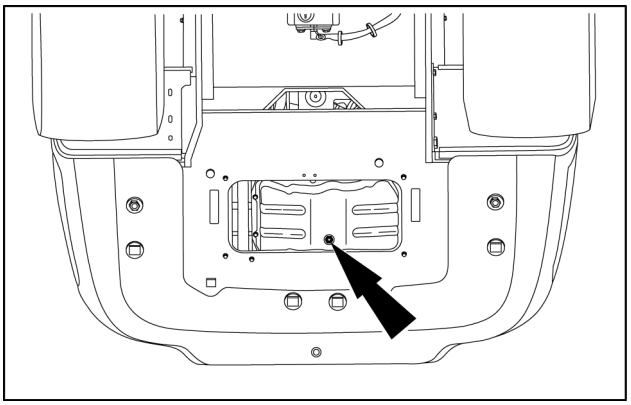
LEIL15CWL0308AB 1

The figure besides shows the machine version with the additional counterweight **(4)**.



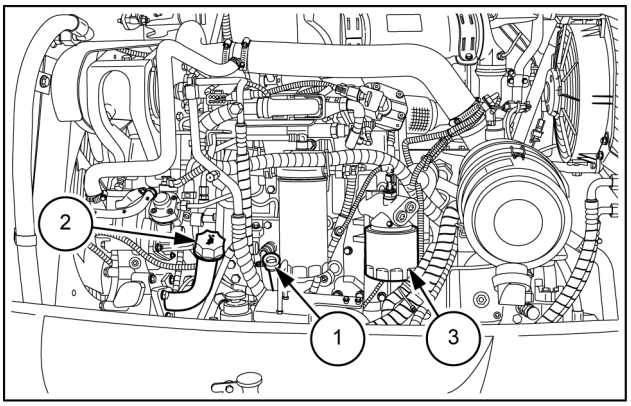
LEIL15CWL0310AA 2

2. Drain the engine oil completely from the engine oil drain plug located at the rear of the machine, under the machine itself. Use a suitable container to collect the used oil.



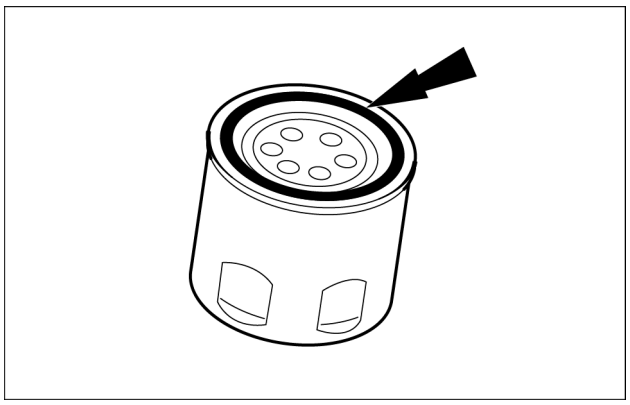
LEIL15CWL0309AB 3

3. Open the engine hood. Oil will drain faster if the oil is warm (not hot) and the dipstick **(1)** is removed from the engine.
4. Locate the oil filter **(3)** in the engine compartment. Clean the area around the filter of dirt and debris.
5. Turn the filter **(3)** counterclockwise to remove it. Remove and discard the filter following the local environmental and waste regulations.



LEIL14CWL0078AB 4

6. Apply a thin layer of clean oil to the new filter gasket.

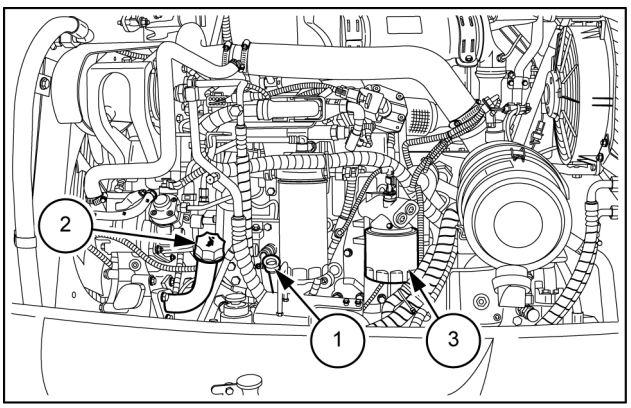


LEIL14CWL0079AB 5

7. Turn manually the new oil filter onto the base until the gasket makes contact with the base and then turn by hand an additional 3/4 turn.

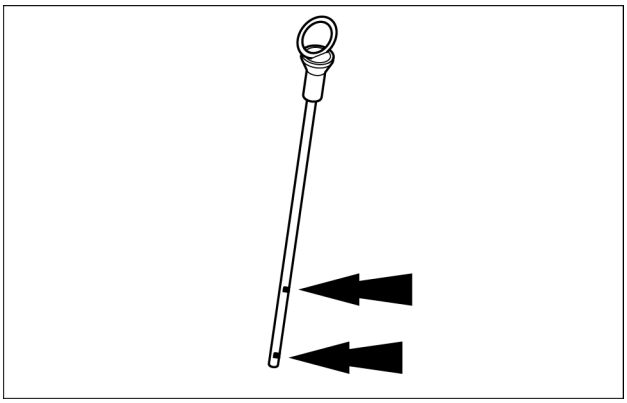
NOTICE: *never use a filter wrench to install a new filter.*

8. Close the remote drain.
9. Loosen and remove the plug of the oil fill location **(2)**. Add engine oil through the oil fill location. Tighten the plug again..
10. Start the engine and run at idle speed. Check the engine oil filter and remote drain for leaks.
11. After two minutes stop the engine.
12. Wait for the engine oil to drain down and remove the dipstick **(1)**. Wipe the dipstick **(1)** with a clean cloth and reinsert it into the engine. .



LEIL14CWL0078AB 6

13. Remove and check the dipstick **(1)** again. The oil level must be close to the higher mark. If necessary, add engine oil through the oil fill location **(2)** and repeat the check.
14. Secure the engine access cover.



LEIL14CWL0070AB 7

Fuel prefilter - Replace

⚠ WARNING

Fuel vapors are explosive and flammable.
Do not smoke while handling fuel. Keep fuel away from flames or sparks. Shut off engine and remove key before servicing. Always work in a well-ventilated area. Clean up spilled fuel immediately. Failure to comply could result in death or serious injury.

W0904A

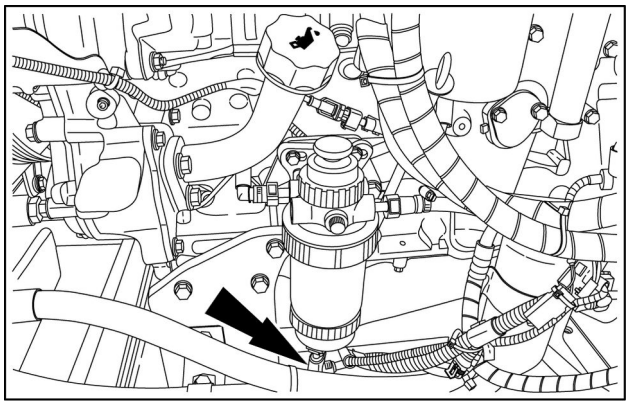
Replace the fuel prefilter when the hourmeter registers 500 hours or more frequently when operating conditions are severe.

Clean the prefilter area, the outside of the prefilter and remove any dirt and debris around the area that might contaminate the system.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.

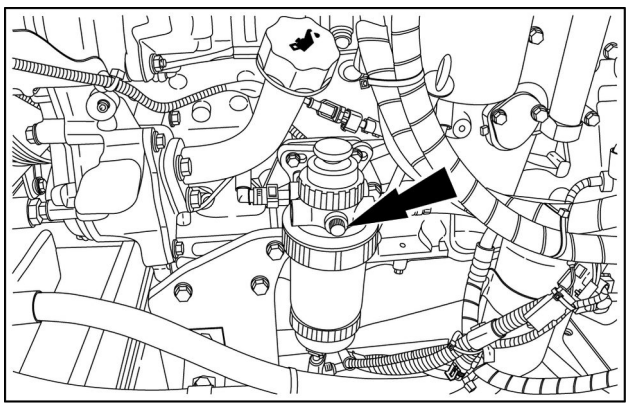
1. Remove the connector. Turn the prefilter counterclockwise to remove.
2. Replace with a new prefilter cartridge: turn clockwise until the cartridge meets the prefilter head. Hand tighten firmly in place.

NOTICE: *never use a filter wrench to tighten a new prefilter on install.*



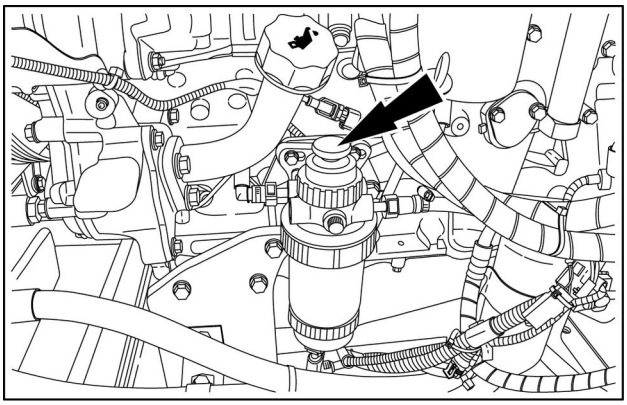
LEIL14CWL0081AA 1

3. Turn counterclockwise one turn to unscrew the drain valve on the fuel prefilter.



LEIL14CWL0081AA 2

4. Push the priming pump to drain the water and/or contaminants from the prefilter into a suitable container until clean fuel flows. Do not allow fuel to spill on engine or ground.
5. Screw and re-engage the drain valve. Replace the connector at bottom of the prefilter.



LEIL14CWL0081AA 3

Fuel filter - Replace

⚠ WARNING

Fire hazard!
When handling diesel fuel, observe the following precautions:
1. Do not smoke.
2. Never fill the tank when the engine is running.
3. Wipe up spilled fuel immediately.
Failure to comply could result in death or serious injury.

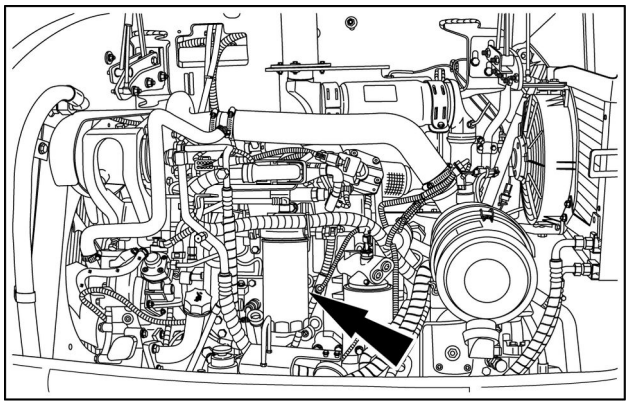
W0099A

Replace the fuel filter when the hourmeter registers 500 hours or more frequently when operating conditions are severe.

Clean the filter head area, the outside of the filter and remove any dirt and debris around the area that might contaminate the system.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.

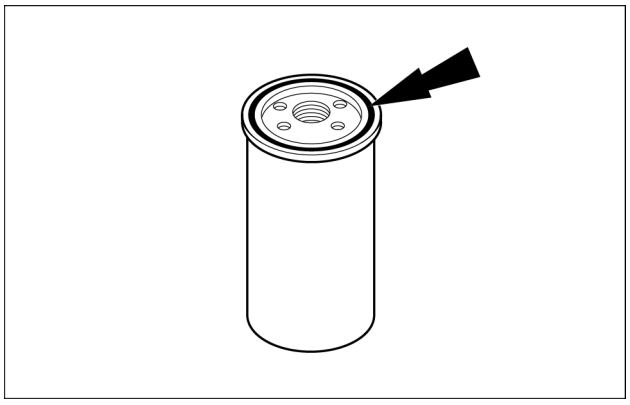
1. Turn the filter counterclockwise and remove. Be sure to capture any fuel remaining in the lines or the filter and discard properly.



LEIL14CWL0073AA 1

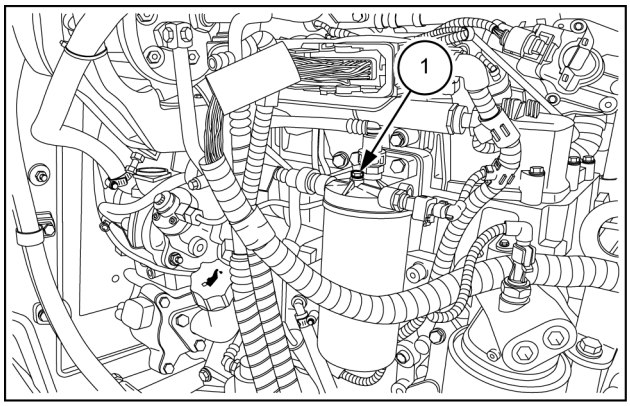
2. Apply a thin layer of diesel fuel on the gasket on the new filter.
3. Install the filter. Use your hands to tighten the filter 1/2 to 3/4 turn after the filter makes contact with the filter head.

NOTICE: *never use a filter wrench to tighten a new filter on install.*



LEIL14CWL0074AB 2

4. Turn counterclockwise two or three turns the purge screw **(1)** on the filter to open it and bleed the air from the fuel system.
5. Screw and re-engage the purge screw **(1)**.



LEIL14CWL0080AB 3

Every 1000 hours

Air intake lines - Check

Check the engine air intake lines every 1000 hours or more frequently if conditions so require.
Air intake hoses and tubes damaged or leaking, influence enormously the engine performance and life.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.
Shut down the engine and wait for the engine to cool down.

Check for dirt or pieces of the air intake system which can reach and damage the engine heavily.

Do not allow the engine to draw in unfiltered air,
Check all the hoses and pipes for tightness. Check that all clamps are correctly in place and tightened.

Remove and replace immediately possible damaged components.

Engine coolant - Replace

⚠ WARNING

Burn hazard!
Hot coolant can spray and scald if you remove the radiator or deaeration tank cap while the system is hot. To remove the cap: allow the system to cool, turn the cap to the first notch, and wait for all pressure to release. Remove the cap only after all pressure has released.
Failure to comply could result in death or serious injury.

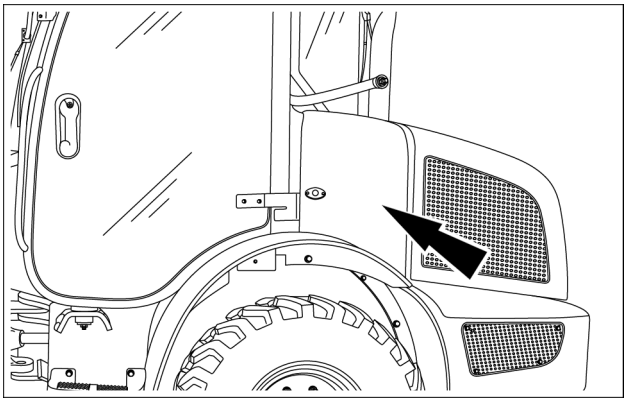
W0367A

Drain and replace the engine coolant every 1000 hours or sooner if conditions so require.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.
Shut down the engine. Wait for the engine to cool and the coolant temperature to reach a safe level.

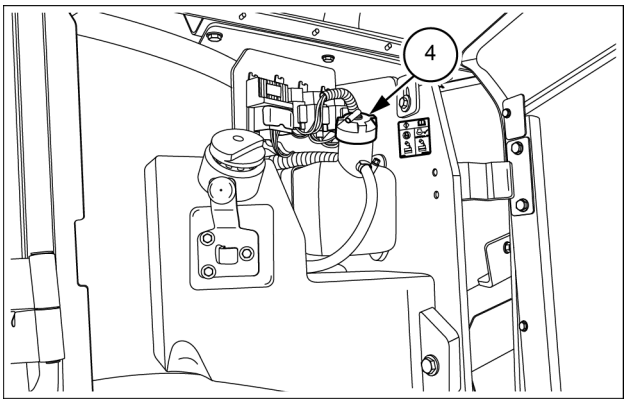
Service specifications	
Type of coolant	**CASE AKCELA ACTIFULL™ OT EXTENDED LIFE COOLANT**
21F total capacity (50% coolant – 50% water)	**13 L** (**3.4 US gal**)
121F total capacity (50% coolant – 50% water)	**13 L** (**3.4 US gal**)
221F total capacity (50% coolant – 50% water)	**13 L** (**3.4 US gal**)
321F total capacity (50% coolant – 50% water)	**13 L** (**3.4 US gal**)

1. Open the panel on the left-hand side to access the engine coolant reservoir.



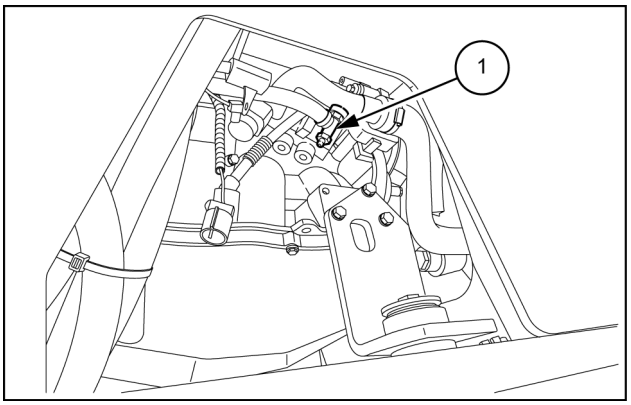
LEIL14CWL0451AA 1

2. After the engine has cooled and the temperature of the coolant has reached a safe level, turn slowly the cap **(4)** and wait for all possible residual pressure to release. Remove the cap **(4)** after pressure release.



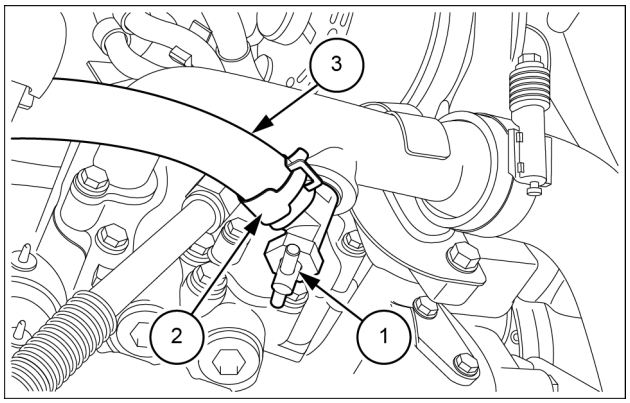
LEIL15CWL0088AB 2

3. Go under the machine and access the tap **(1)** in the engine compartment through the opening in the frame located behind the rear axle.



LEIL14CWL0483AB 3

4. Turn off the tap **(1)**. Loosen the clamp **(2)** and disconnect the cab heating hose **(3)**.
   Open the tap **(1)** to drain the coolant from the engine block.
   Collect the escaping coolant and discard properly following the local environmental and waste regulations.



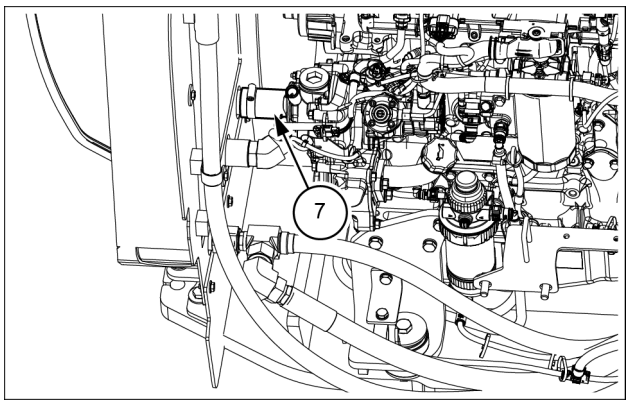
LEIL14CWL0484AB 4

5. If necessary, in order to accelerate the coolant drain operation, disconnect the radiator hose **(7)** from the radiator and drain the coolant.
   Collect the escaping coolant and discard properly following the local environmental and waste regulations.

NOTE: *for clarity, figure **5** does not show the counterweight, the fan and the fan cooling box.*

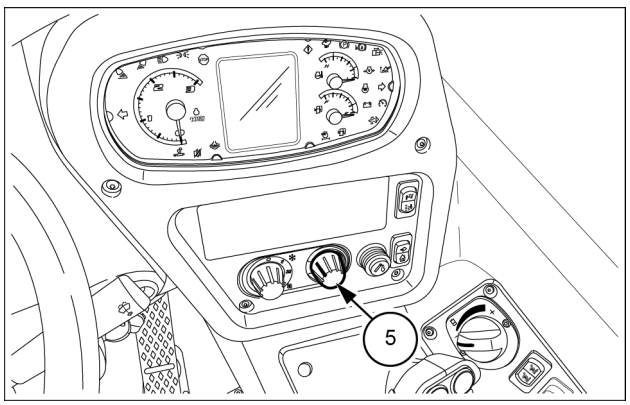
6. Reconnect the cab heating hose **(3)** to the tap **(1)**. Leave the tap **(1)** opened.

NOTE: *if the operation **5** has been carried out, reconnect the radiator hose **(7)**.*



LEIL17CWL0007AB 5

7. Turn the key switch to the ON position. Turn the heater control knob **(5)** completely clockwise to the red zone (hot air temperature).



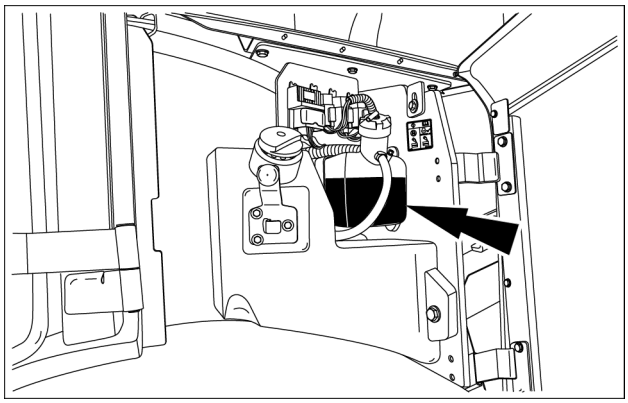
LEIL17CWL0005AB 6

8. Add coolant as required to raise the coolant level to the full mark.

NOTE: *make sure to use the proper ratio of water and antifreeze/coolant. Do not overfill.*

9. Turn off the tap **(1)**.

10. Start the engine and wait the engine warms up to the operating temperature (**80 – 90 °C** (**176 – 194 °F**) to allow the thermostatic valve to open). Top up continuously the engine coolant reservoir up to stabilize the coolant level at the full mark.

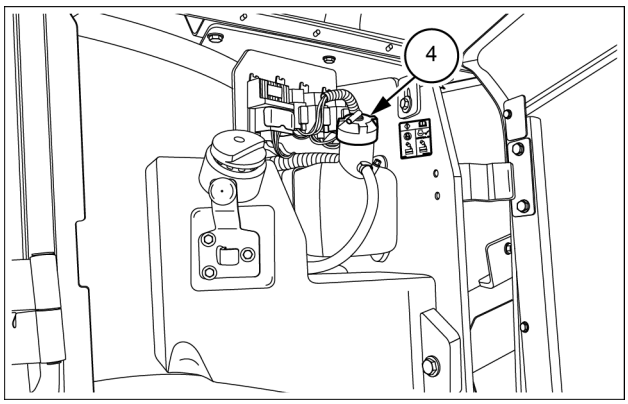


LEIL15CWL0089AA 7

11. Reinstall the cap **(4)**. Close the left-hand panel.

12. Operate the machine for about 15 minutes.

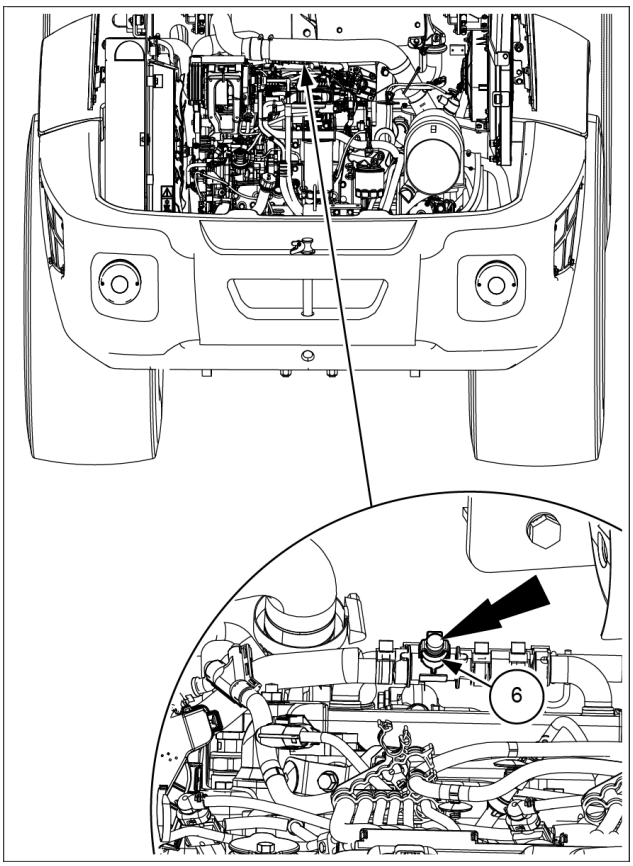
13. Shut down the engine and wait for the engine to cool down to a safe level. Check the engine coolant reservoir level. The coolant level must be between the full and add marks on the reservoir.



LEIL15CWL0088AB 8

14. Open the engine hood and locate the Exhaust Gas Recirculation (EGR) valve **(6)** in the engine compartment, behind the air intake hose.
Open the tap on the EGR valve **(6)**. Wait for the coolant drain from the EGR valve **(6)**. Collect the escaping coolant and discard properly following the local environmental and waste regulations.

15. Reinstall the tap on the EGR valve **(6)**.



LEIL17CWL0006BB 9

Hydraulic oil tank - Oil change and cleaning

⚠ WARNING

Pressurized hydraulic fluid can penetrate the skin and cause severe injuries.
Hydraulic fluid is under extreme pressure. Rest the bucket or attachment on the ground. Shut the engine off, turn the key on, and move the hydraulic control lever through all movements several times to relieve residual pressure in the system.
Failure to comply could result in death or serious injury.

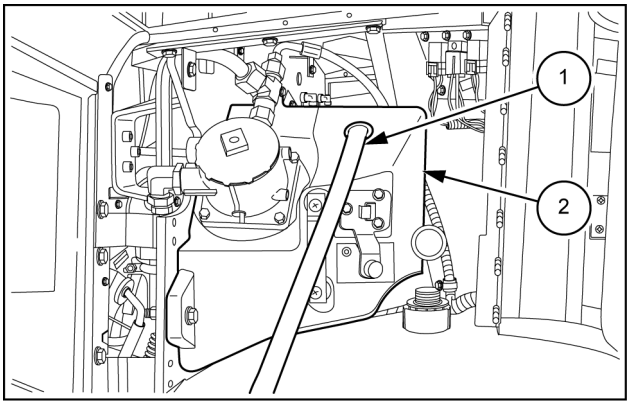
W0161A

Change the hydraulic oil and clean the hydraulic oil tank every 1000 hours, or more frequently if conditions so require.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.
Relieve residual pressure from the hydraulic system.

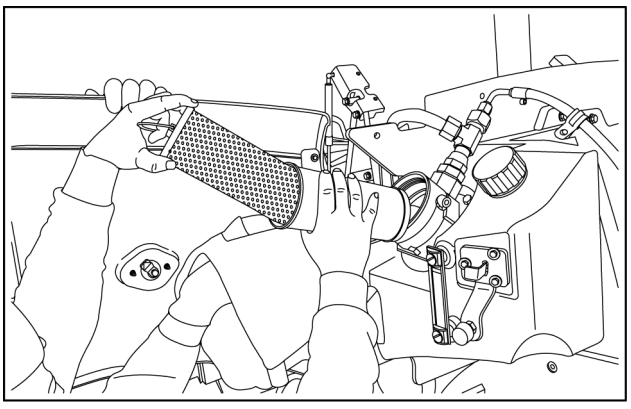
Service specifications	
Type of oil	**CASE AKCELA HYDRAULIC EXCAVATOR FLUID**
21F total system capacity	**53 L** (**14 US gal**)
121F total system capacity	**53 L** (**14 US gal**)
221F total system capacity	**53 L** (**14 US gal**)
321F total system capacity	**53 L** (**14 US gal**)

1. Locate and open the access door on the right-hand side of the machine to access the hydraulic oil tank **(2)**.
2. Remove the cap from the hydraulic oil tank **(2)**. Insert into the hole the hose **(1)** connected to a suction pump and suck the oil from the tank **(2)**.
   Collect the hydraulic oil and discard properly following the local environmental and waste regulations



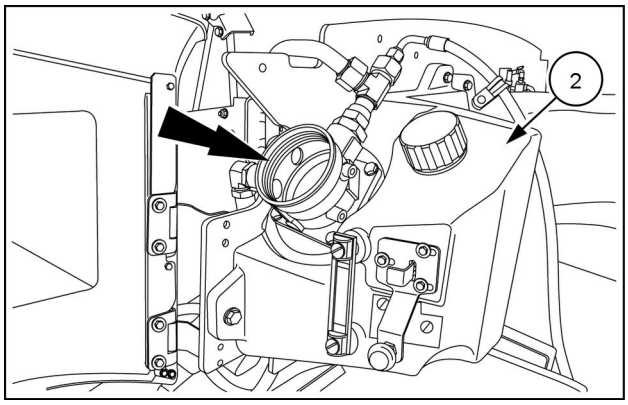
LEIL14CWL0219AB 1

3. Remove the filter caps, the filter body and the filter from the hydraulic oil tank.



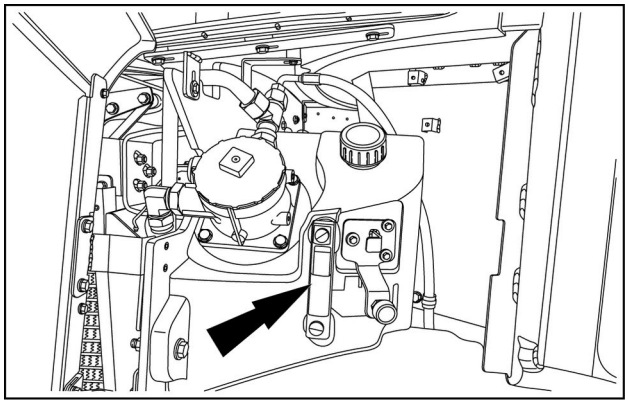
LEIL14CWL0480AA 2

4. Through the opening, clean the inside and the bottom of the hydraulic oil tank **(2)**. Use clean hydraulic oil or washing oil to clean the hydraulic oil tank.



LEIL14CWL0487AA 3

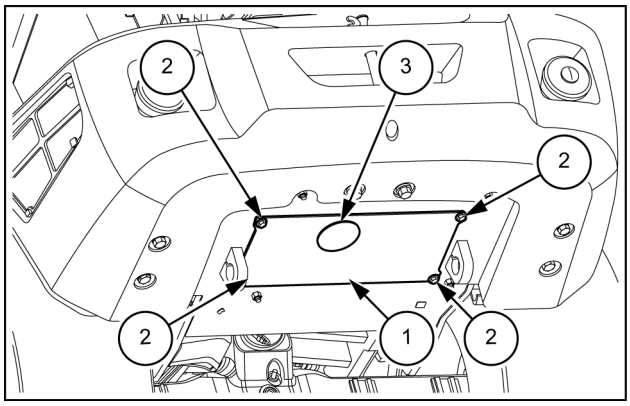
5. Reinstall the filter, the filter body and the filter caps.
6. Add hydraulic oil until the proper oil level is reached. Check oil level in the sight gauge.
7. Reinstall the cap of the hydraulic oil tank.



LEIL14CWL0076AA 4

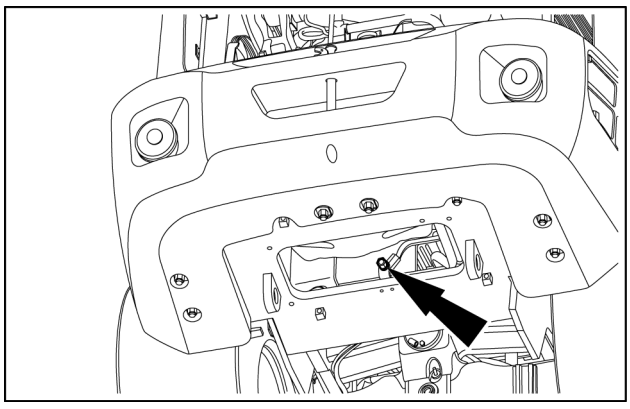
Remote drain of the hydraulic oil (optional)

1. In the machines with the remote drain of the hydraulic oil, the remote drain is located at the rear of the machine, near the engine oil pan.
2. To access the remote drain, remove the four screws **(2)** and remove the plate **(1)** with the plug **(3)**.



LEIL15CWL0308AB 5

3. Drain completely the hydraulic oil from the hydraulic oil tank through the remote drain.
   Collect the hydraulic oil and discard properly following the local environmental and waste regulations



LEIL15CWL0311AB 6

Hydraulic oil filter - Replace

⚠ WARNING

Pressurized hydraulic fluid can penetrate the skin and cause severe injuries.
Hydraulic fluid is under extreme pressure. Rest the bucket or attachment on the ground. Shut the engine off, turn the key on, and move the hydraulic control lever through all movements several times to relieve residual pressure in the system.
Failure to comply could result in death or serious injury.

W0161A

⚠ WARNING

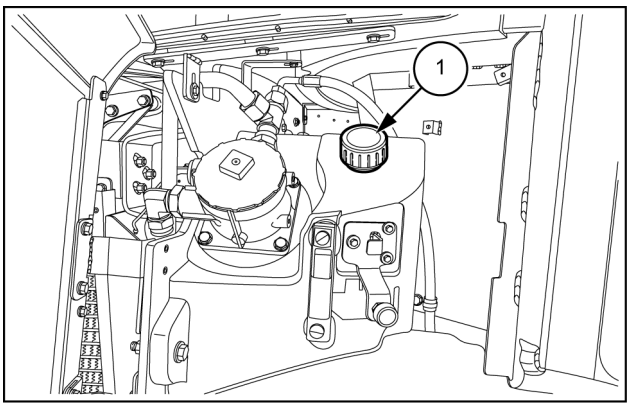
Pressurized fluid can penetrate the skin and cause severe injuries.
Keep hands and body away from any pressurized leak. DO NOT use your hand to check for leaks. Use a piece of cardboard or paper. If fluid penetrates the skin, seek medical attention immediately.
Failure to comply could result in death or serious injury.

W0158A

Replace the hydraulic oil filter when the hourmeter registers 1000 hours. Change the hydraulic oil filter every 1000 hours thereafter or more frequently when operating conditions are severe.

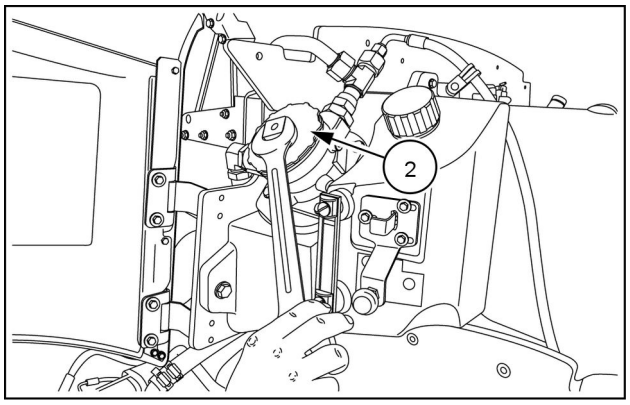
Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.
Relieve residual pressure from the hydraulic system.

1. Slowly loosen the filler cap **(1)** on the hydraulic oil tank to release any residual pressure in the tank. Leave it loose during the procedure.



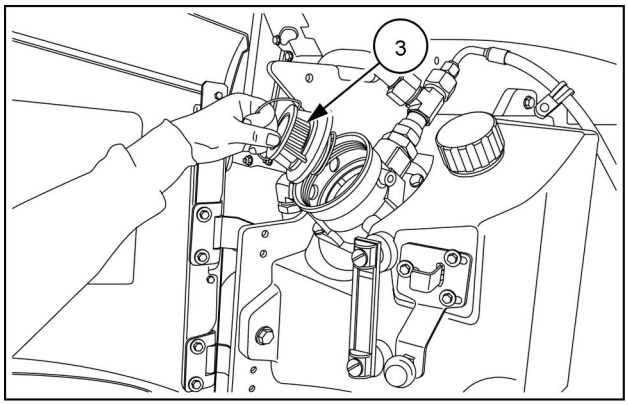
LEIL14CWL0075AB 1

2. Turn the filter cap **(2)** counterclockwise to remove it.



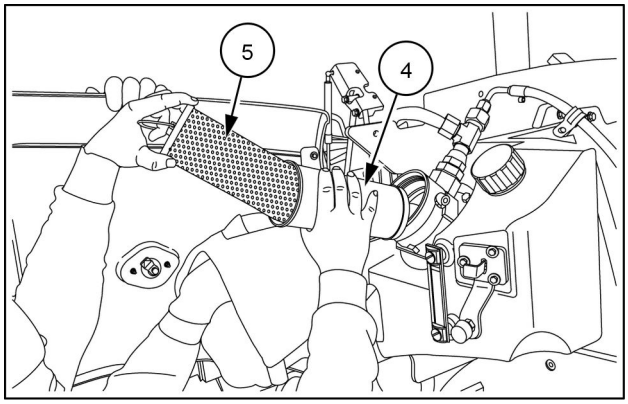
LEIL14CWL0478AA 2

3. Remove the filter inner cap **(3)**.



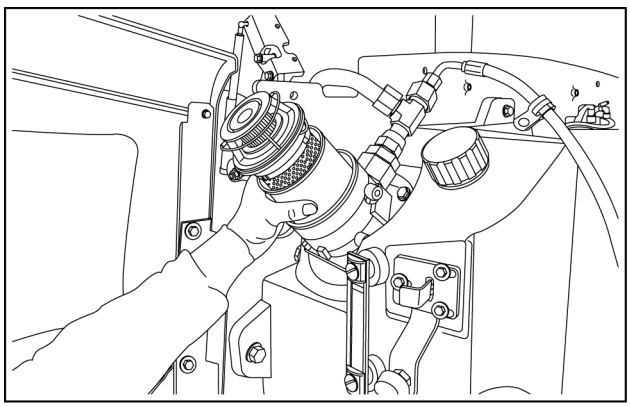
LEIL14CWL0479AA 3

4. Extract the filter body **(4)** with the filter **(5)**.
   Remove the filter **(5)** from the filter body **(4)**.
   Drain the residual oil from the filter body **(4)** into a suitable container. Clean the filter body **(4)**.



LEIL14CWL0480AA 4

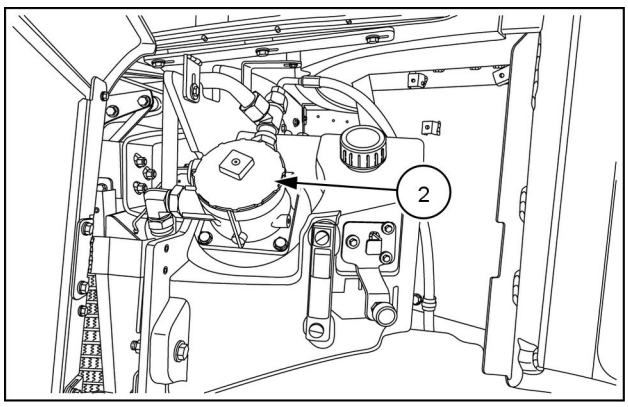
5. Install a new filter in the filter body **(4)** and install the filter inner cap **(3)** on the new filter.
6. Reinstall the filter body with the new filter and the filter inner cap.



LEIL14CWL0481AA 5

7. Lubricate the gasket and threads of the filter cap **(2)** with clean oil and install. After the filter makes contact with the filter head tighten 1/2 to 3/4 turns.
8. Tighten the filler cap **(1)** on the hydraulic oil tank.
9. Start the engine and run at **1000 RPM**. Have an assistant check for leaks around the filter area. Stop the engine and check and hydraulic level. Top off if necessary.

NOTICE: *never use a filter wrench to tighten a new filter on install.*



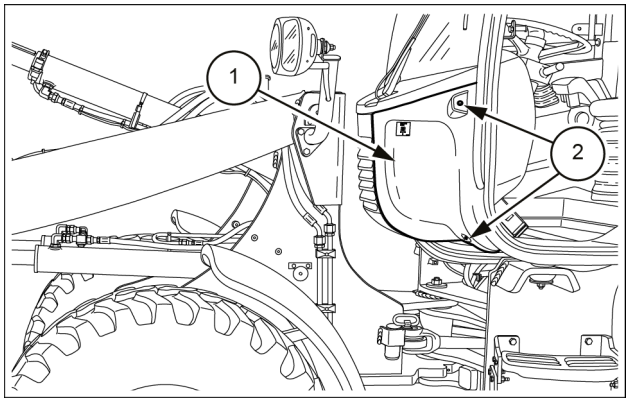
LEIL14CWL0076AA 6

Cab air filter - Replace

Clean the cab air filter when the hourmeter registers 1000 hours. Replace the filter every 1000 hours thereafter or more frequently when operating in extremely dusty conditions.

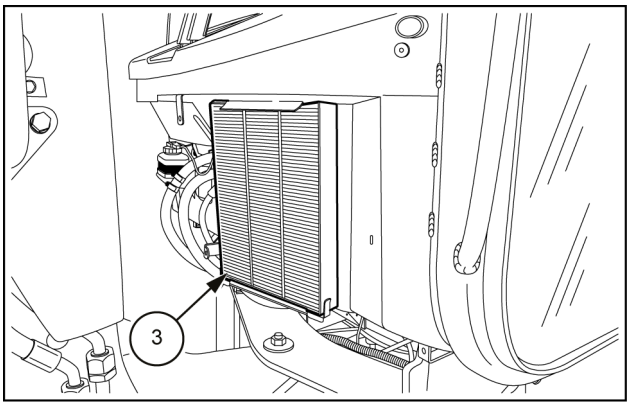
Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.

1. The cab air filter **(3)** is located behind the panel **(1)** fastened to the front side of the external frame of the cab. Remove the retaining screws **(2)** and remove the panel **(1)**.



LEIL15CWL0090AB 1

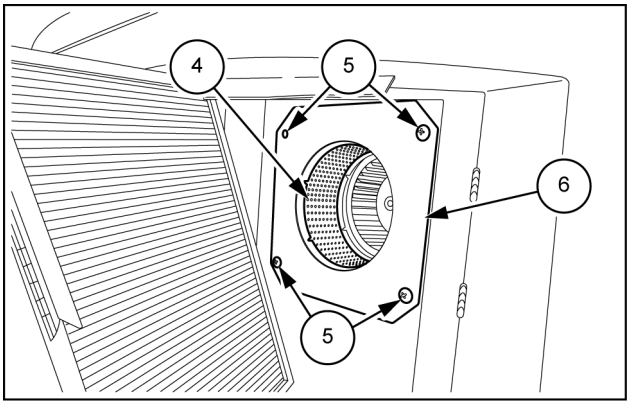
2. Pull the cab air filter **(3)** forward and check for debris or tears. Wipe the filter housing with a damp cloth.
Clean dust from the filter, using compressed air if necessary.



LEIL14CWL0013AB 2

Recirculation air filter

1. The recirculation air filter **(4)** is located behind the cab air filter **(3)**. Remove the screws **(5)**, the filter cover **(6)** and the filter **(4)**.
2. Replace the filter **(4)** with a new one.
3. Install the new filter and use the screws **(5)** to secure the cover plate **(6)**.



LEIL14CWL0014AB 3

Front axle oil - Change

⚠ WARNING

Chemical hazard!
When handling fuel, lubricants, and other service chemicals, follow the manufacturer's instructions. Wear Personal Protective Equipment (PPE) as instructed. Do not smoke or use open flame. Collect fluids in proper containers. Obey all local and environmental regulations when disposing of chemicals.
Failure to comply could result in death or serious injury.

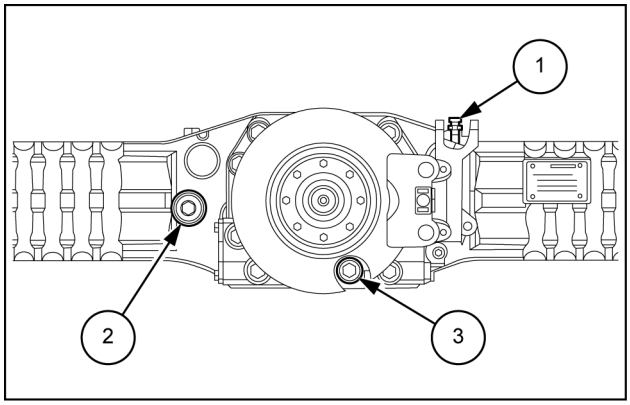
W0371A

Drain and change the front axle oil every 1000 hours or more frequently if conditions so require.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.
Place wheel chocks against the tires to prevent machine movements.

Service specifications	
Type of oil	**CASE AKCELA GEAR 135 H EP LS**
21F–121F front axle	
Differential	**7.5 L** (**2.0 US gal**)
Reduction gear (each side)	**0.7 L** (**0.2 US gal**)
221F–321F front axle	
Differential	**8.0 L** (**2.1 US gal**)
Reduction gear (each side)	**0.7 L** (**0.2 US gal**)

1. Clean the area around the filler plug **(2)** and drain plug **(3)** of the front axle.
2. Activate the breather valve **(1)** to bleed air.
3. Place a suitable container with sufficient capacity to capture the old oil under the front axle and drain. Unscrew the drain plug **(3)** and allow oil to drain. Collect the escaping oil and discard properly following the local environmental and waste regulations.
4. After complete draining, clean and reinstall the drain plug **(3)**.
5. Unscrew and remove the filler plug **(2)**. Add oil. The oil level must be flush with the hole.
6. Clean and reinstall the filler plug **(2)**.



LEIL14CWL0463AB 1

Rear axle oil - Change

⚠ WARNING

Chemical hazard!
When handling fuel, lubricants, and other service chemicals, follow the manufacturer's instructions. Wear Personal Protective Equipment (PPE) as instructed. Do not smoke or use open flame. Collect fluids in proper containers. Obey all local and environmental regulations when disposing of chemicals.
Failure to comply could result in death or serious injury.

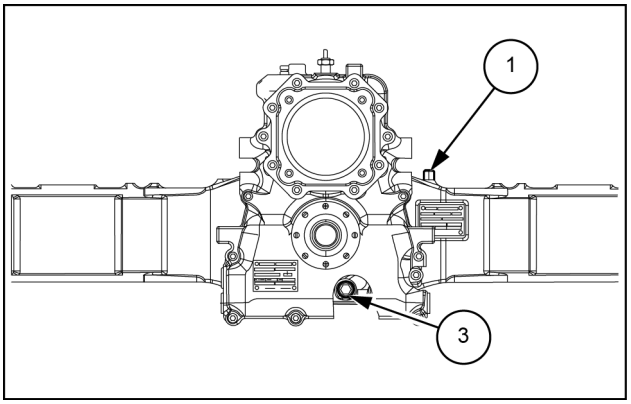
W0371A

Drain and change the rear axle oil every 1000 hours or more frequently if conditions so require.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.
Place wheel chocks against the tires to prevent machine movements.

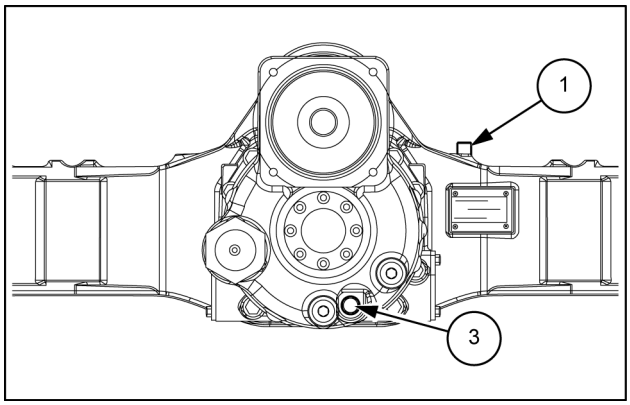
Service specifications	
Type of oil	**CASE AKCELA GEAR 135 H EP LS**
21F–121F rear axle	
Differential	**7.5 L** (**2.0 US gal**)
Reduction gear (each side)	**0.7 L** (**0.2 US gal**)
Gearbox	**1.3 L** (**0.3 US gal**)
221F–321F (standard models) rear axle	
Differential	**8.0 L** (**2.1 US gal**)
Reduction gear (each side)	**0.7 L** (**0.2 US gal**)
Gearbox	**1.3 L** (**0.3 US gal**)
221F–321F (“High Speed” models) rear axle	
Differential	**8.0 L** (**2.1 US gal**)
Reduction gear (each side)	**0.7 L** (**0.2 US gal**)
Gearbox	**0.75 L** (**0.2 US gal**)

1. Clean around the area of the drain plug **(3)** of the rear axle.
2. Activate the breather valve **(1)** to bleed air.
3. Place a suitable container with sufficient capacity to capture the old oil under the rear axle and drain. Unscrew the drain plug **(3)** and allow oil to drain. Collect the escaping oil and discard properly following the local environmental and waste regulations.
4. After complete draining, clean and reinstall the drain plug **(3)**.



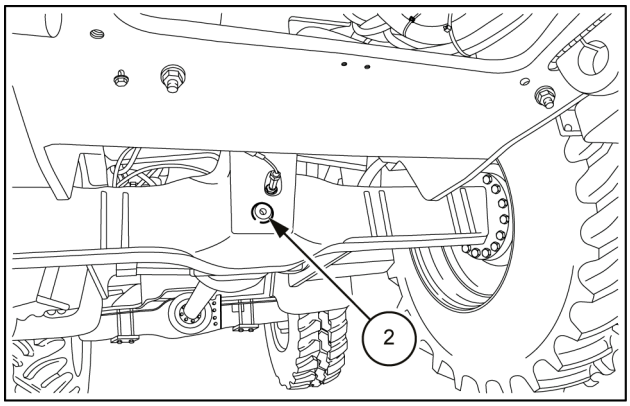
LEIL14CWL0464AB 1

NOTE: *the figure beside shows the layout of the breather valve* ***(1)*** *and drain plug* ***(3)*** *for the "High Speed" models rear axle.*



LEIL15CWL0085AB 2

5. Clean the area around the filler plug **(2)** of the rear axle.
6. Unscrew and remove the filler plug **(2)**.
   Add oil. The oil level must be flush with the hole.
7. Clean and reinstall the filler plug **(2)**.



LEIL14CWL0462AB 3

Axles reduction gears oil - Change

⚠ WARNING

Chemical hazard!
When handling fuel, lubricants, and other service chemicals, follow the manufacturer's instructions. Wear Personal Protective Equipment (PPE) as instructed. Do not smoke or use open flame. Collect fluids in proper containers. Obey all local and environmental regulations when disposing of chemicals.
Failure to comply could result in death or serious injury.

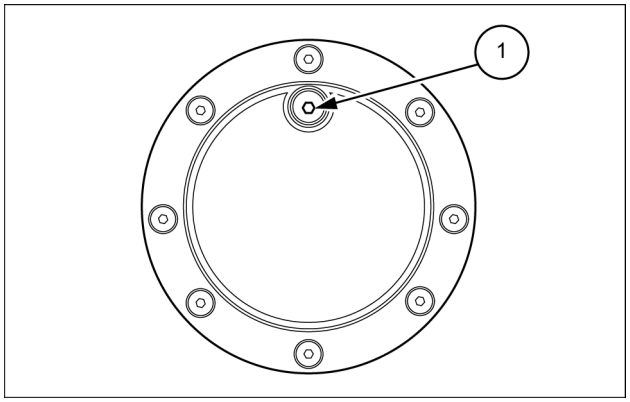
W0371A

Change the oil of the axles reduction gears every 1000 hours, or more frequently if conditions so require.
To drain and fill the oil and to check the oil level in the reduction gear, the axle must be horizontal.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.

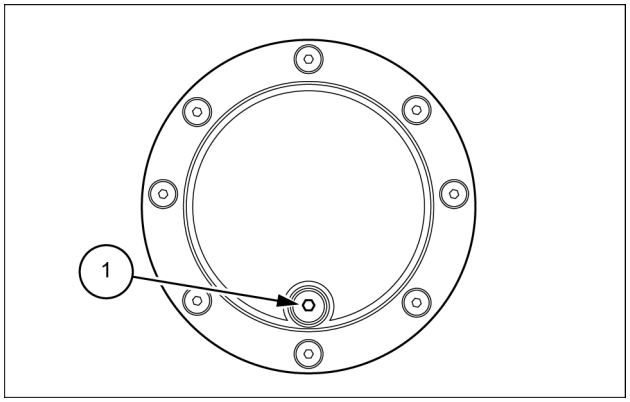
Service specifications	
Type of oil	**CASE AKCELA GEAR 135 H EP LS**
21F–121F front axle and rear axle	
Reduction gear (each side)	**0.7 L** (**0.2 US gal**)
221F–321F front axle and rear axle	
Reduction gear (each side)	**0.7 L** (**0.2 US gal**)

1. Rotate the wheel end so that the plug **(1)** is at the highest position.
   Partially unscrew the plug **(1)** to release possible pressure.



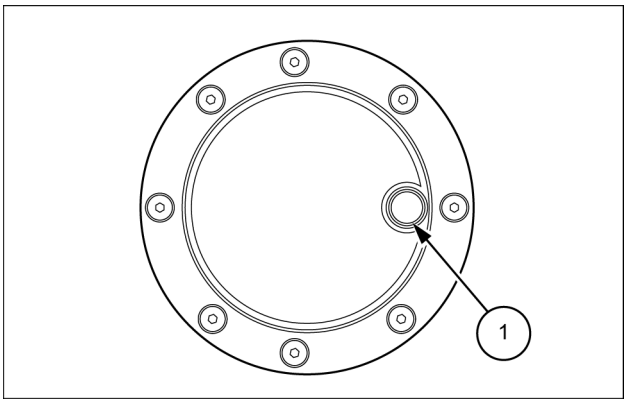
LEIL14CWL0495AB 1

2. Rotate the wheel end so that the plug **(1)** is toward the ground. Remove the plug **(1)** and drain the oil.
   Collect the escaping oil and discard properly following the local environmental and waste regulations.



LEIL14CWL0496AB 2

3. Rotate the wheel end so that the hole **(1)** is in the horizontal position.
4. Add oil in the hole **(1)**. The oil level must be flush with the hole **(1)**, so fill in new oil until oil comes out of the hole **(1)**.
5. Clean and retighten the plug **(1)**.



LEIL14CWL0497AB 3

Gearbox oil - Change

⚠ WARNING

Chemical hazard!
When handling fuel, lubricants, and other service chemicals, follow the manufacturer's instructions. Wear Personal Protective Equipment (PPE) as instructed. Do not smoke or use open flame. Collect fluids in proper containers. Obey all local and environmental regulations when disposing of chemicals.
Failure to comply could result in death or serious injury.

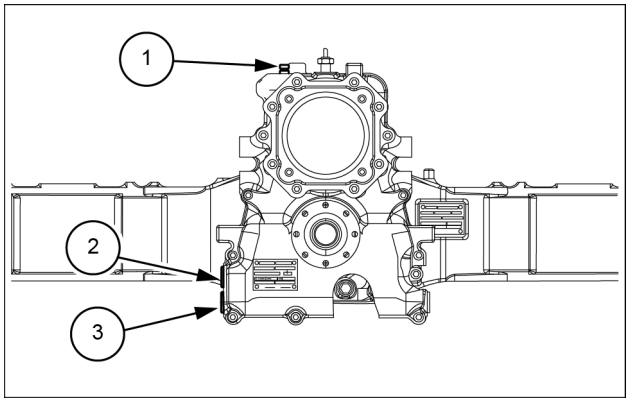
W0371A

Drain and change the gearbox oil every 1000 hours or more frequently if conditions so require.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.
Place wheel chocks against the tires to prevent machine movements.

Service specifications	
Type of oil	**CASE AKCELA GEAR 135 H EP LS**
21F–121F rear axle	
Gearbox	**1.3 L** (**0.3 US gal**)
221F–321F (standard models) rear axle	
Gearbox	**1.3 L** (**0.3 US gal**)
221F–321F (“High Speed” models) rear axle	
Gearbox	**0.75 L** (**0.2 US gal**)

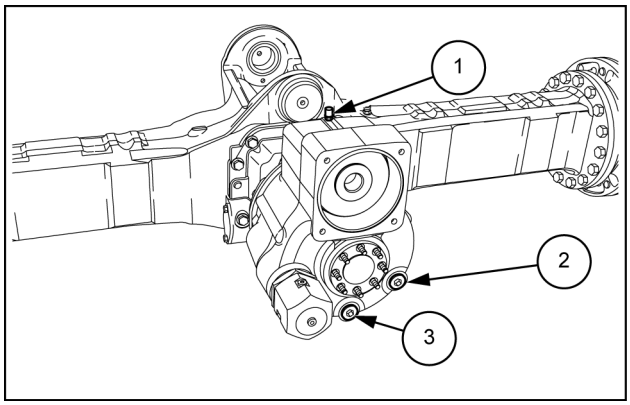
1. Locate the filler plug **(2)** and the drain plug **(3)** on the right-hand side of the gearbox.
2. Clean around the area of the drain plug **(3)** of the gearbox.
3. Activate the breather valve **(1)** of the gearbox to bleed air.
4. Place a suitable container with sufficient capacity to capture the old oil under the gearbox and drain. Unscrew the drain plug **(3)** and allow oil to drain. Collect the escaping oil and discard properly following the local environmental and waste regulations.
5. After complete draining, clean and reinstall the drain plug **(3)**.
6. Clean the area around the filler plug **(2)** of the gearbox.
7. Unscrew and remove the filler plug **(2)**. Add oil. The oil level must be flush with the hole.
8. Clean and reinstall the filler plug **(2)**.



LEIL14CWL0642AB 1

“High Speed” models

1. Locate the filler plug **(2)** and the drain plug **(3)** on the front side of the gearbox.
2. Clean around the area of the drain plug **(3)** of the gearbox.
3. Activate the breather valve **(1)** of the gearbox to bleed air.
4. Place a suitable container with sufficient capacity to capture the old oil under the gearbox and drain. Unscrew the drain plug **(3)** and allow oil to drain. Collect the escaping oil and discard properly following the local environmental and waste regulations.
5. After complete draining, clean and reinstall the drain plug **(3)**.
6. Clean the area around the filler plug **(2)** of the gearbox.
7. Unscrew and remove the filler plug **(2)**. Add oil. The oil level must be flush with the hole.
8. Clean and reinstall the filler plug **(2)**.



LEIL15CWL0086AB 2

Battery charge - Check

⚠ WARNING

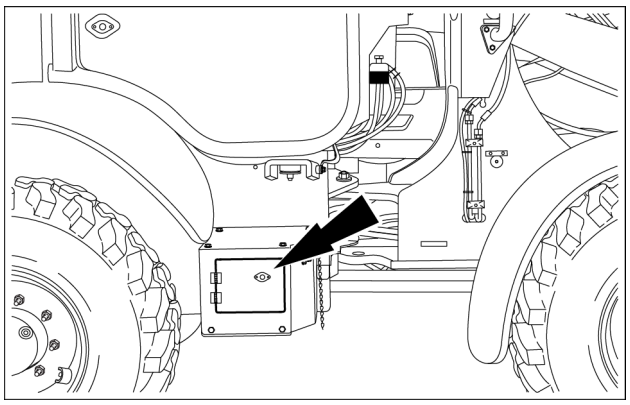
Electrical shock hazard!
Do not reverse battery terminals. Connect positive cable ends to positive terminals (+) and negative cable ends to negative terminals (-).
Failure to comply could result in death or serious injury.

W0262A

Check the battery charge every 1000 hours.

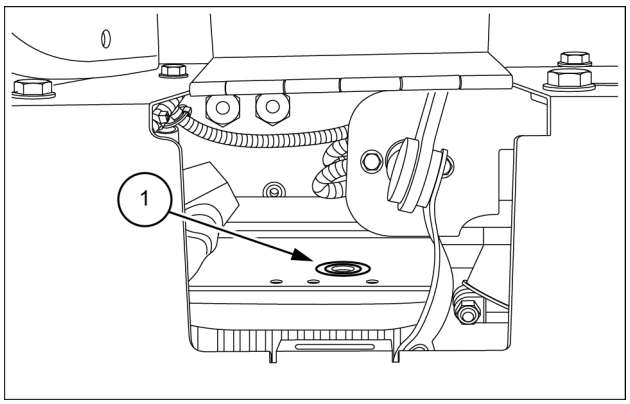
Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.

1. The battery is located on the right-hand side of the machine, below the operator's compartment.
   Open the outer panel to access the battery.



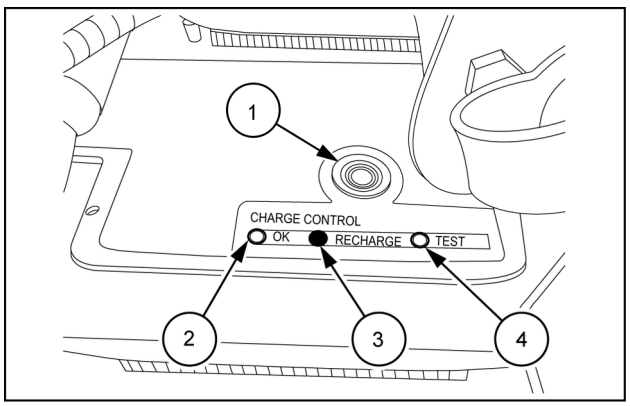
LEIL14CWL0633AB 1

2. Check the color of the charge indicator **(1)**.



LEIL14CWL0476AB 2

3. Compare the color of the charge indicator **(1)** with the three colors **(2)**, **(3)** and **(4)** reported in the charge control legend, located below the charge indicator **(1)**.
   Color **(2)** (green) indicates that the battery is charged and needs no maintenance.
   Color **(3)** (black) indicates that battery recharge is required.
   Color **(4)** (white) indicates that the battery is discharged. In this case, replace immediately the battery.



LEIL14CWL0477AB 3

Every 2000 hours

Engine air filter - Replace

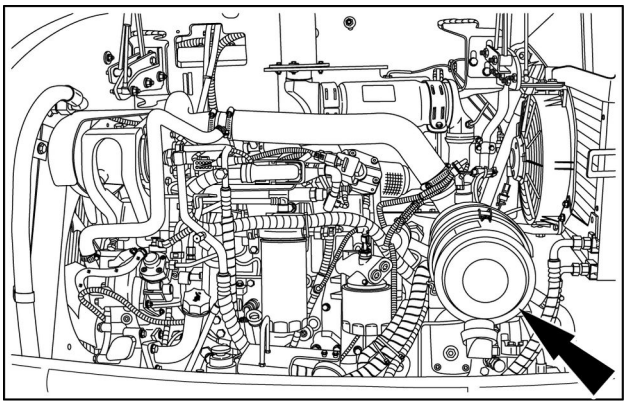
The air filter should be checked periodically for dirt and debris build up. Replace the engine primary and secondary air filter every 2000 hours or each year, whichever occurs first.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.

NOTE: *replace the primary element if the filter warning lamp on the instrument cluster illuminates or the audible alarm sounds. If the caution warnings continue after replacing the primary filter, replace the secondary filter as well.*

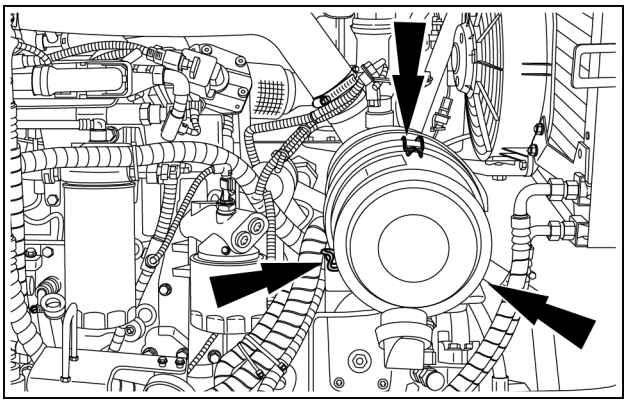
NOTE: *under normal conditions, the secondary filter should be replaced after three primary filter replacement. Replace the filters more often if working conditions so require.*

1. Raise the engine hood and locate the engine air filter in the engine compartment.



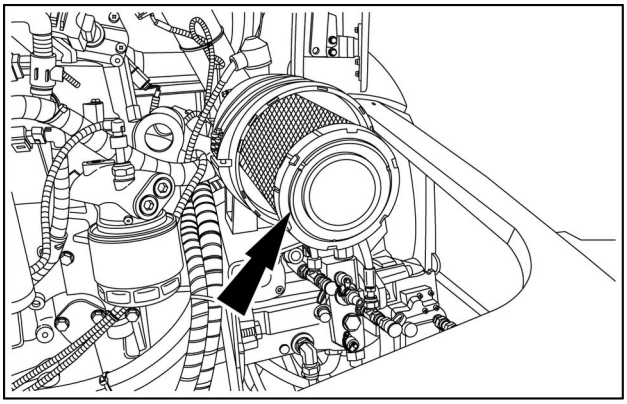
LEIL14CWL0073AA 1

2. Release the three clips and remove the filter cover.



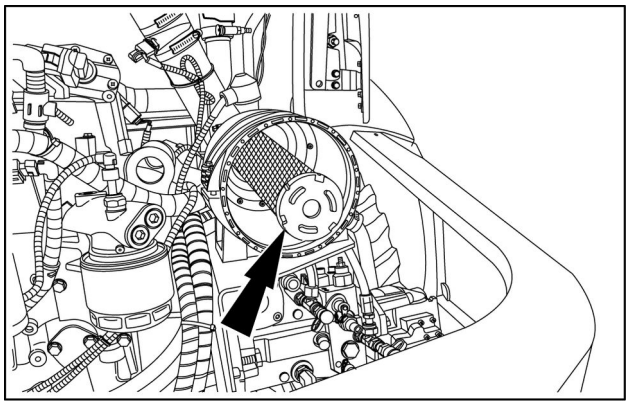
LEIL14CWL0106AB 2

3. Remove the primary filter.
   After the primary filter has been removed, wipe the inside of the filter housing body clean of any dirt and debris prior to removing the secondary filter.



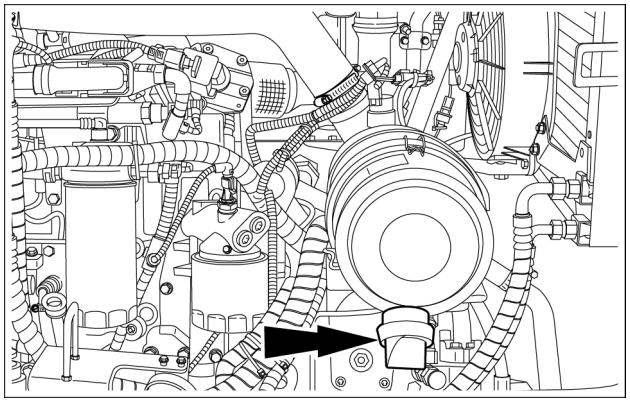
LEIL14CWL0107AA 3

4. Remove the secondary filter, therefore.



LEIL14CWL0108AA 4

5. Take a new secondary filter and apply a thin layer of lubricant on its sealing face.
6. Install the new secondary filter.
7. Install a new primary filter.
8. Push on the end of the discharge nozzle to drain dust and debris from the filter housing.



LEIL14CWL0111AB 5

9. Install the cover and lock the clips to secure the cover in place. If the cover does not secure in place properly, recheck the filter installation. The cover will be difficult to install if the filters are not properly installed.
10. Close the engine hood.

Engine valve clearance - Check and adjust

Check valve adjustment

This should be performed by a qualified service technician when the hour meter registers 2000 hours. Contact your authorized dealer.

Hoses and wiring

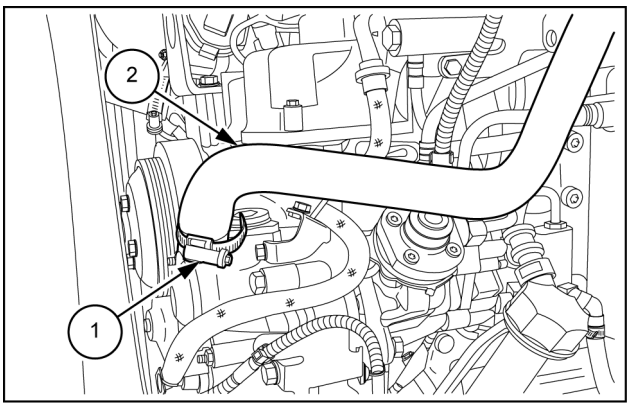
Check all hoses and wiring for damage. If damage occurred, see your authorized dealer for repair or replacement.

Blowby recirculation filter - Replace

Replace the blowby recirculation filter every 2000 hours, or more frequently if conditions so require.

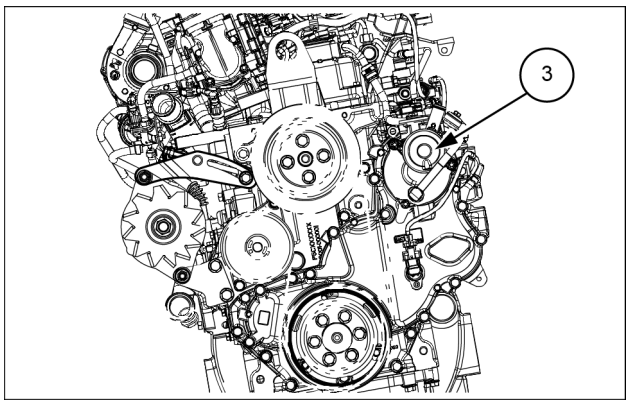
Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.
Prior operation:
Remove the radiator and the protective grid of the engine fan to access the blowby recirculation filter.

1. Loosen the clamp **(1)** and disconnect the oil steam recovery hose **(2)**.



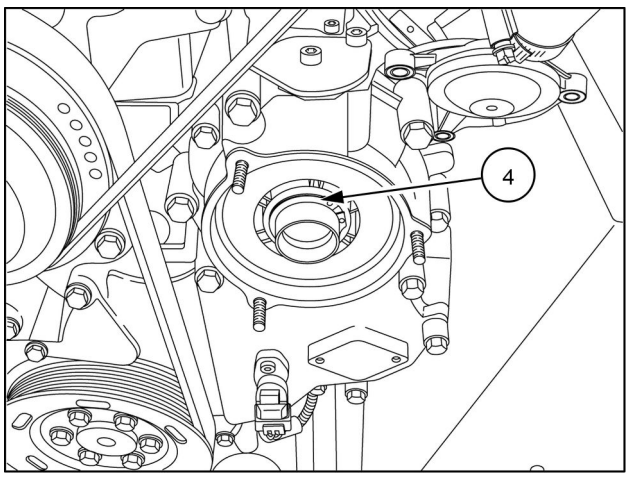
LEIL14CWL0220AB 1

2. Remove the cover **(3)**.



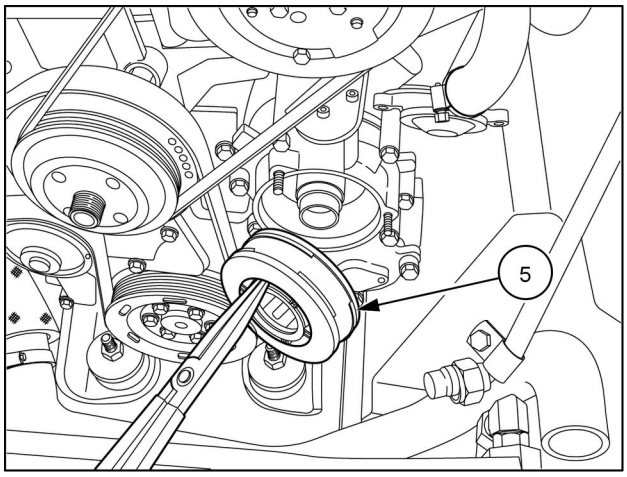
LEIL14CWL0492AB 2

3. Remove the snap ring **(4)**.



RAPH12SSL0060AA 3

4. Slide the filter **(5)** off the drive hub.



RAPH12SSL0059AA 4

5. Slide the new filter on the drive hub.
6. Reinstall the snap ring **(4)** and the cover **(3)**.

Brake oil - Change

⚠ WARNING

Maintenance hazard!
Before performing maintenance on the brake system, chock the traction and steering wheels to prevent machine movement.
Failure to comply could result in death or serious injury.

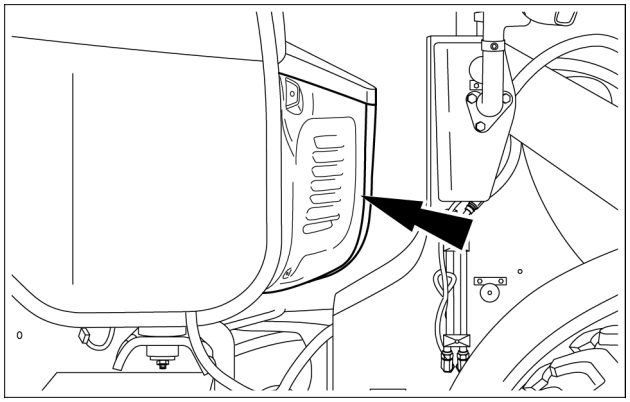
W0064A

Change the brake oil every 2000 hours or more frequently if conditions so require.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.

Service specifications	
Type of oil	**CASE AKCELA LHM FLUID**
21F capacity	**1 L** (**1.1 US qt**)
121F capacity	**1 L** (**1.1 US qt**)
221F capacity	**1 L** (**1.1 US qt**)
321F capacity	**1 L** (**1.1 US qt**)

1. The brake oil tank is located behind the panel fastened to the front side of the external frame of the cab, on the right-hand side.



LEIL15CWL0128AB 1

2. Contact an authorized dealer to perform the brake oil change and the brake system bleeding.

Every 3000 hours

Drive belt - Replace

⚠ WARNING

Entanglement hazard!
Always stop the engine and engage the parking brake, unless otherwise instructed in this manual, before checking and/or adjusting any drive belt or chain.
Failure to comply could result in death or serious injury.

W0097A

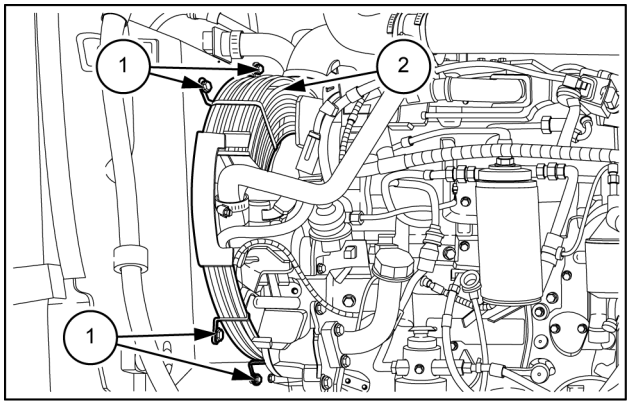
Check the belt for correct tension, wear, and damage. Wrong belt tension may cause battery charge failure, engine overheating, or belt wear.
Replace the belt when the hourmeter registers 3000 hours.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.

Maintenance specifications	
Visual check	Every 50 hours
Belt replacement	Every 3000 hours

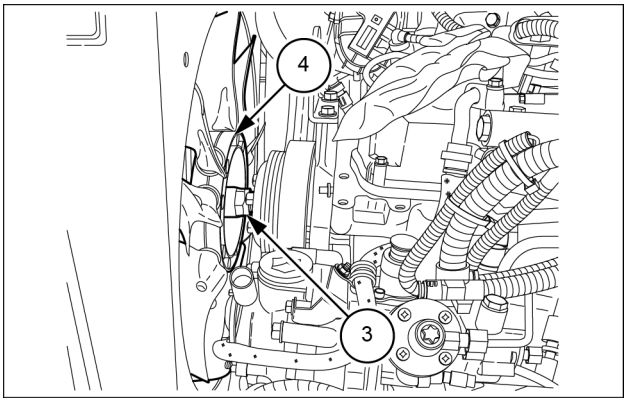
NOTICE: *if the engine runs with the drive belt loose, the drive belt can slip and cause the engine to overheat or the battery to receive insufficient charge.*

1. Remove the four screws **(1)** to remove the fan guard **(2)**.



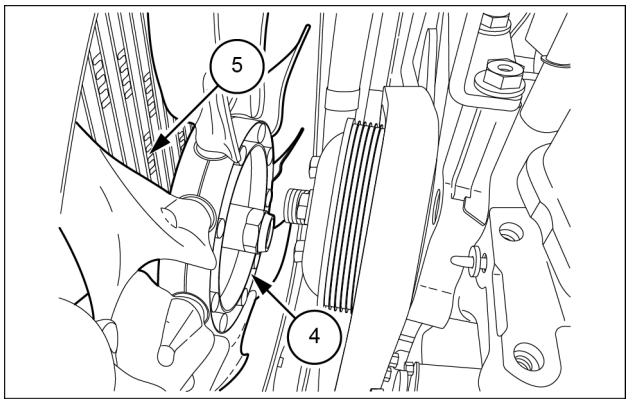
LEIL14CWL0469AB 1

2. Loosen the nut **(3)** to unscrew the fan **(4)**.
   The nut **(3)** is left-handed: turn the nut **(3)** clockwise in respect to the engine to loosen the nut **(3)**.



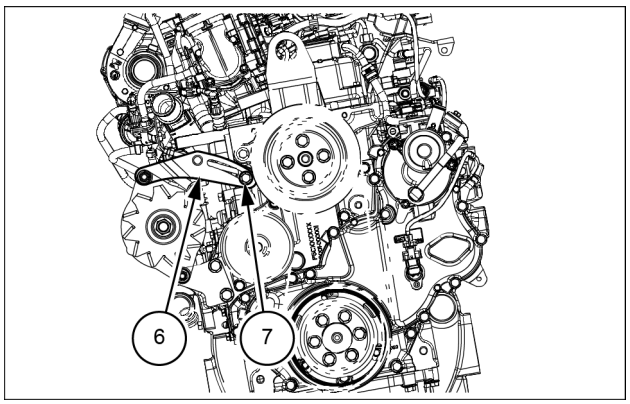
LEIL14CWL0456AB 2

3. Lean the fan **(4)** against the radiator group **(5)**.



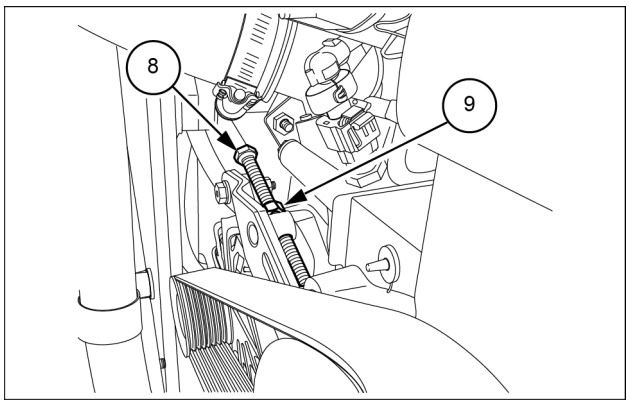
LEIL14CWL0457AB 3

4. Loosen the screw **(7)** of the bracket **(6)**.



LEIL14CWL0468AB 4

5. Loosen the locknut **(9)** to unscrew the adjustment screw **(8)**.
   Loosen and unscrew the adjustment screw **(8)** to release the tension of the drive belt.
   Remove the drive belt.



LEIL14CWL0475AB 5

6. Install a new belt. Adjust the screw **(8)** until the belt reaches the correct tension.
7. Tighten the locknut **(9)** and the screw **(7)**.

Fuel tank - Cleaning

⚠ WARNING

Fire hazard!
When handling diesel fuel, observe the following precautions:
1. Do not smoke.
2. Never fill the tank when the engine is running.
3. Wipe up spilled fuel immediately.
Failure to comply could result in death or serious injury.

W0099A

⚠ WARNING

Chemical hazard!
When handling fuel, lubricants, and other service chemicals, follow the manufacturer's instructions. Wear Personal Protective Equipment (PPE) as instructed. Do not smoke or use open flame. Collect fluids in proper containers. Obey all local and environmental regulations when disposing of chemicals.
Failure to comply could result in death or serious injury.

W0371A

⚠ WARNING

Fire hazard!
Leaking fuel could cause a fire. DO NOT perform the bleed procedure while the engine is hot.
Failure to comply could result in death or serious injury.

W1119A

⚠ WARNING

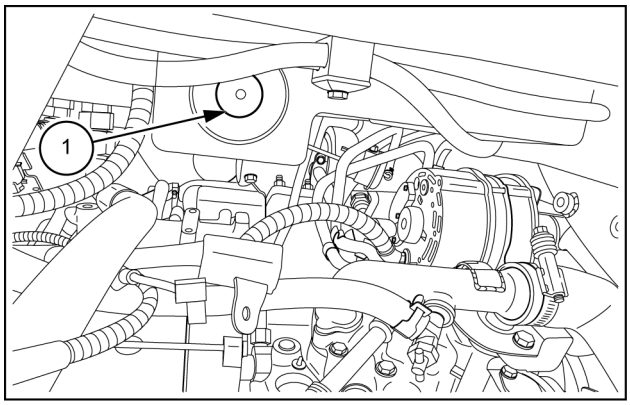
Fire hazard!
Keep the machine (especially the engine area) free of all crop material, oil, and fuel. Repair all oil, fuel, or coolant leaks immediately.
Failure to comply could result in death or serious injury.

W1344A

Clean the fuel tank every 3000 hours or more frequently if conditions so require.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.
Shut down the engine and wait for the engine to cool down.

1. Go under the machine and access the drain plug **(1)** of the fuel tank in the engine compartment through the opening in the frame located behind the rear axle.

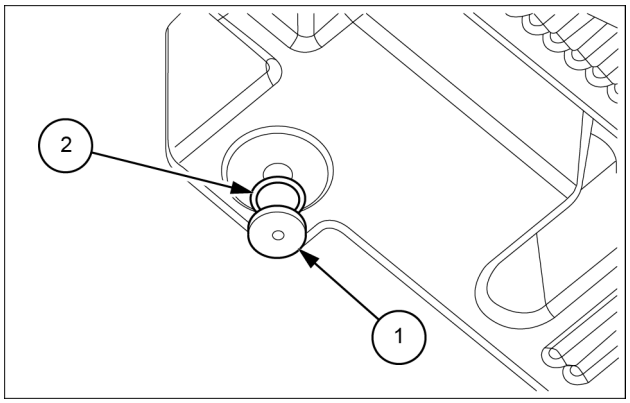


LEIL14CWL0603AB 1

2. Remove the drain plug **(1)** and the O-ring **(2)**. Drain the remaining fuel into a suitable container.
3. Collect the escaping fuel. Filter the escaping fuel for reuse or discard properly following the local environmental and waste regulations.
4. Rinse the fuel tank with fresh fuel.

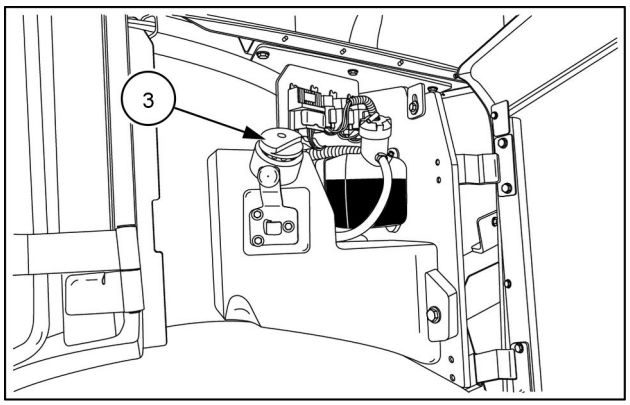
NOTICE: *to clean and rinse, use fuel and do not use petrol, petroleum or other solvents.*

5. Install a new O-ring **(2)** and reinstall the drain plug **(1)**.



LEIL14CWL0604AB 2

6. Loosen the fuel tank cap **(3)** and refill the fuel tank.
7. Retighten the fuel tank cap **(3)**.
8. Bleed the fuel system. Check for leaks and rectify them, if necessary.



LEIL14CWL0452AA 3

As required

Radiator - Cleaning

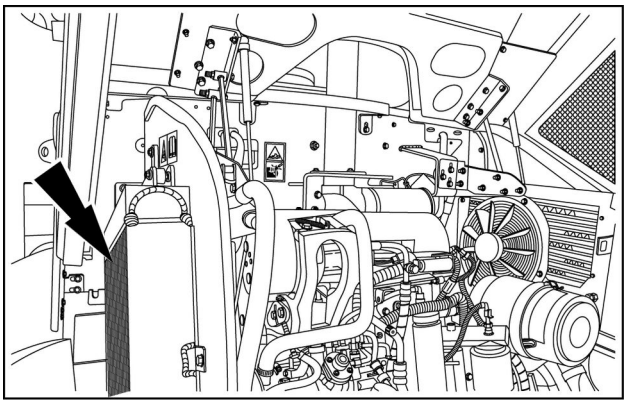
Clean the engine radiator as required. Keep the radiator clean to make sure the air flows inside it and cools the engine down.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.
Wait for the cooling system to cool down

1. Open the engine hood. The radiator is located on the left-hand side of the engine compartment.
2. To clean the radiator, use a vacuum cleaner or a high-pressure jet cleaner.
   Remove dirt on a regular basis, especially between the radiator fins.

NOTICE: *during the cleaning operation with water jets, always wear a face shield.*

3. Do not to bend or to damage the fins during the cleaning operation:
   Never exceed a pressure of **7000 kPa** (**1015 psi**)
   Hold a minimum distance of **300 – 500 mm** (**11.8 – 19.7 in**) between the nozzle and the radiator.
   Hold the water jet vertically to the fins, in order to reduce the pressure on the fins and to improve the cleaning

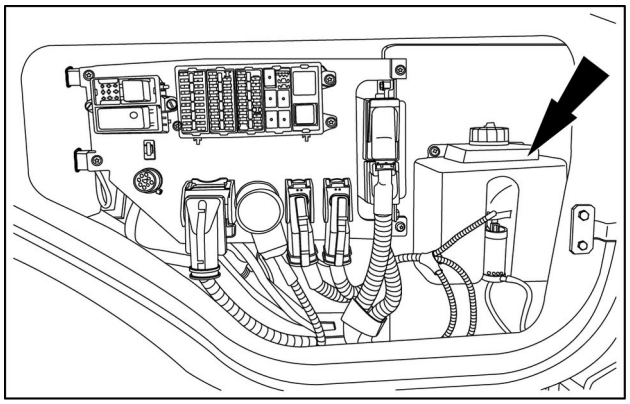


LEIL14CWL0033AA 1

Windshield washer fluid level - Check

Check the windshield fluid level as required. The windshield washer reservoir is located on the right-hand side of the machine, behind the fuse access panel.
If the windshield fluid level is too low, remove the filler cap and add a windshield solution as required. Reinstall the cap.

NOTE: *use professional detergent fluid SC35 diluted with water in relation to the temperature of use. With a 50 – 50 solution of detergent and water the liquid does not freeze until* ***-10 °C*** *(****14 °F****). Below this temperature, use pure detergent.*



LEIL14CWL0453AA 1

Hydraulic connectors and hoses - Replace

Replace the hydraulic connectors, fittings and hoses as required.

To prevent an increased risk of failure, replace the hydraulic hoses after a six-year period of use.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.
Relieve residual pressure from the hydraulic system.

Prior to replacing hydraulic hoses and fittings, relieve the pressure from the hydraulic system and drain the hydraulic oil.

Prevent hydraulic oil and oily wastes from seeping into the ground or water.
Collect the escaping oil and discard properly following the local environmental and waste regulations.

Check for the presence of leaks in the hydraulic system lines.
Quickly repair any hydraulic oil leaks in order to prevent waste, possible damage and dirt from entering the system. Search for hydraulic leaks with the engine running and let it run at a speed between **1200 – 1500 RPM**.

Replace immediately the hoses which show signs of damage, cuts, scratches, swellings or leaks at fittings.

NOTICE: *while replacing or assembling a pipe or hose, make sure that all elements are perfectly clean and free from any trace of dirt.*

Always use original spare parts and never reuse used lines or fittings.

In order to guarantee the gasket seal, do not overtighten or under-tighten the fittings.

After replacing a hose or a fitting, bleed the system.

Battery - Replace

⚠ WARNING

Battery gas can explode!
To prevent an explosion: 1. Always disconnect the negative (-) battery cable first. 2. Always connect the negative (-) battery cable last. 3. Do not short circuit the battery posts with metal objects. 4. Do not weld, grind, or smoke near a battery.
Failure to comply could result in death or serious injury.

W0011A

⚠ WARNING

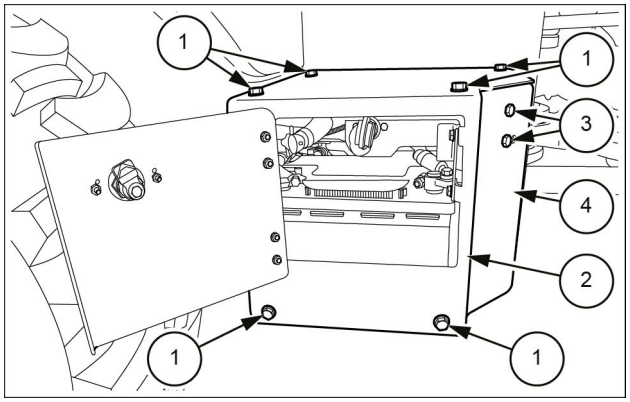
Electrical shock hazard!
Do not reverse battery terminals. Connect positive cable ends to positive terminals (+) and negative cable ends to negative terminals (-).
Failure to comply could result in death or serious injury.

W0262A

Replace the battery, as required.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.
Turn the battery main switch in the OFF position.

1. Remove the six bolts **(1)** to remove the battery cover **(2)**.
2. Remove the two bolts **(3)** to remove the bracket **(4)**.



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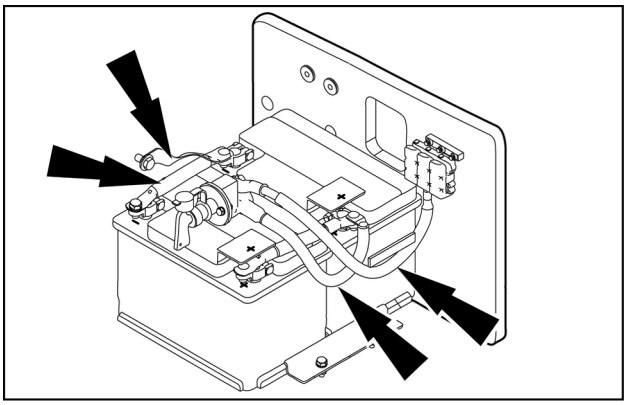
3. Disconnect all the cables.
   When disconnecting the battery cables, always disconnect the negative (-) cables first, then disconnect the positive (+) cables.



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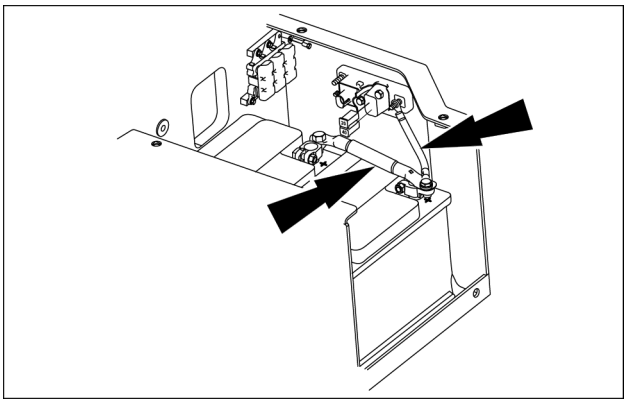
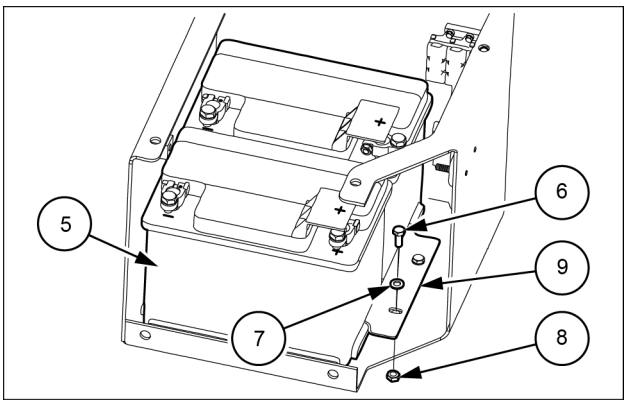


LEIL14CWL0607AA 3

4. Remove the bolts **(6)**, the washers **(7)** and the nuts **(8)** to remove the battery **(5)** from the bracket **(9)**.
5. Prior to installing a new battery, thoroughly clean the contact surfaces of the battery poles and terminals.
6. Install a new battery of the correct voltage.
   Use the bolts **(6)**, the washers **(7)** and the nuts **(8)** to install the new battery to the bracket **(9)**.
7. Connect the positive (+) cables to the positive terminal first, and then connect the negative (-) cables to the negative terminal.
   Do not overtighten the terminal nuts to prevent damage.
8. Reinstall the bracket **(4)** and the battery cover **(2)**.



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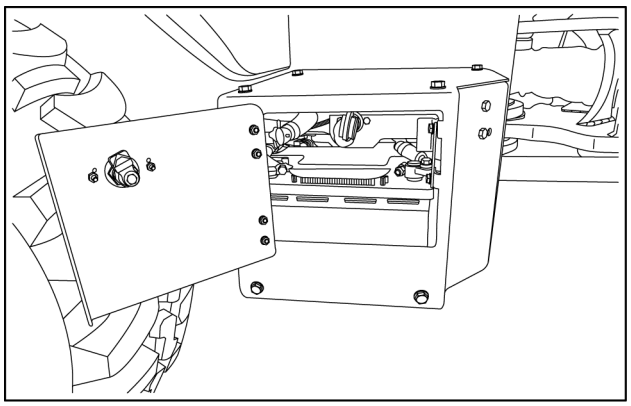


LEIL14CWL0609AA 5

Lights and rotary beacon - Replace

Replace defective lights bulbs or the rotary beacon bulb, as required.

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.

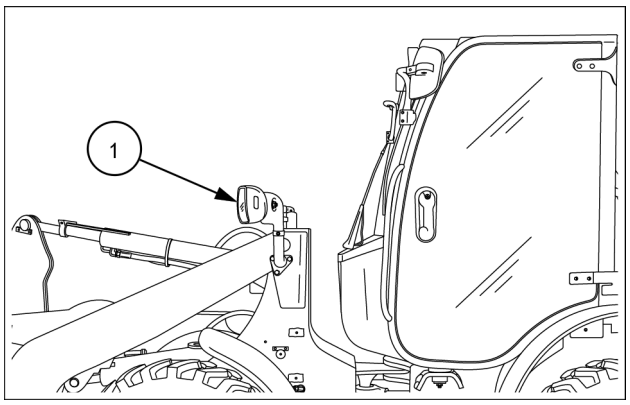
Prior to replacing a bulb, shut down the engine and remove the starter key.

Replace defective bulbs with new bulbs of the same power.
Never touch new bulbs with bare fingers. Finger marks and dirt will burn in when the bulb is hot and may reduce the service life of the bulb.

Prior to installing a new bulb, remove all traces of corrosion from the holder and the electrical contacts.

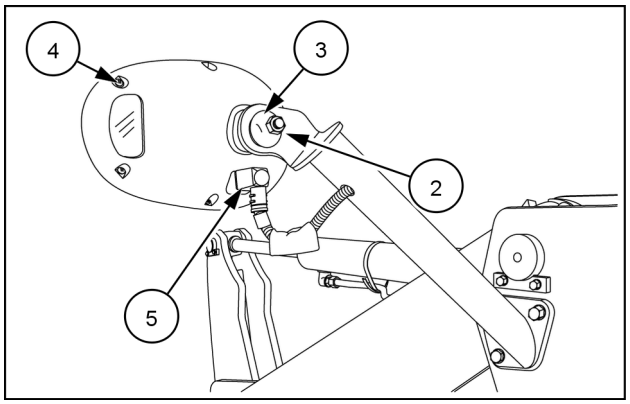
Front driving lights

1. Locate the front driving lights **(1)** on the machine.



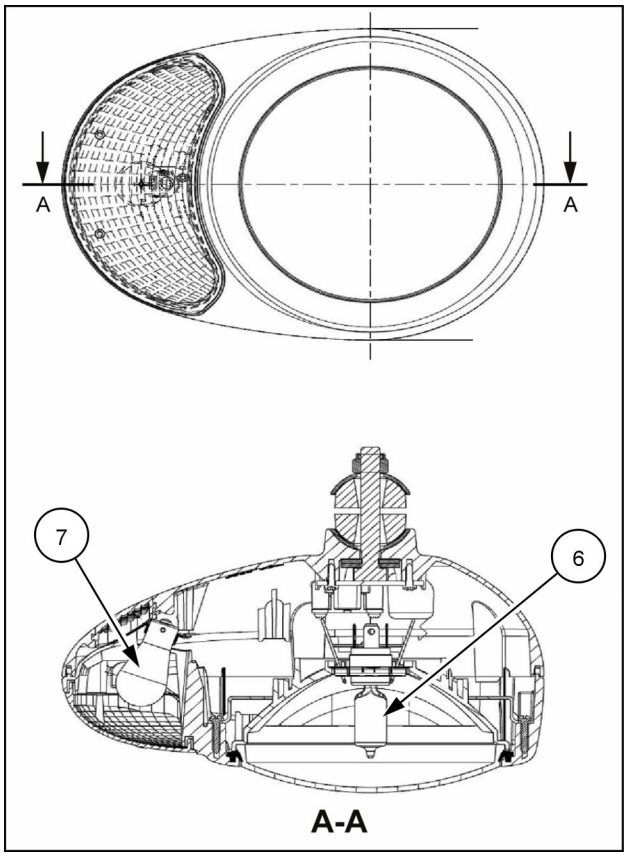
LEIL14CWL0616AA 1

2. Disconnect the connector **(5)**.
3. Remove the nut **(2)** and the hemisphere joint **(3)** to remove the front driving light from its support.
4. Remove the six screws **(4)** to remove the external cover of the light.



LEIL15CWL0327AA 2

5. Replace the front light bulb **(6)** and the direction light bulb **(7)** with corresponding bulbs of the same wattage.



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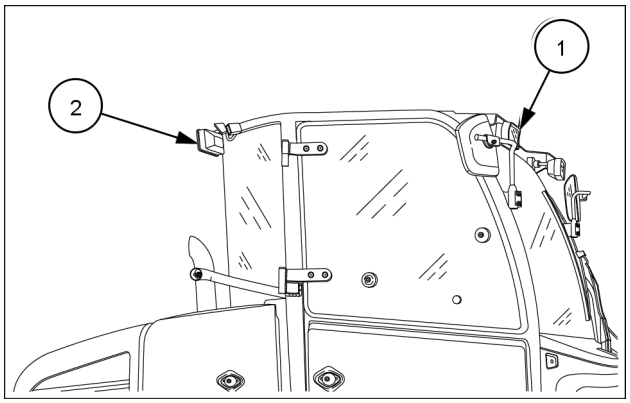
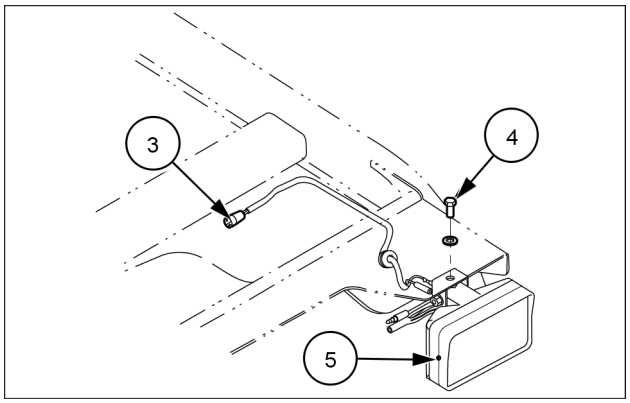
Work lights (optional)

1. Locate the front work lights **(1)** and. rear work lights **(2)** on the machine.



LEIL14CWL0617AB 4

2. Disconnect the connector **(3)**.
3. Remove the screw **(4)** with the related washer to remove the work light from its support.
4. Remove the screws **(5)** to remove the external cover.
5. Replace the inner bulb of the work light with a bulb of the same wattage.



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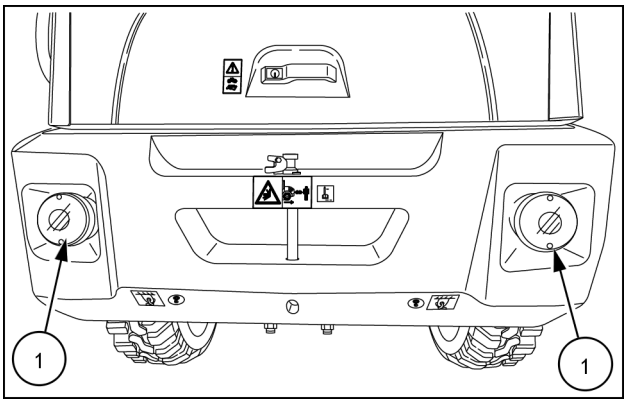
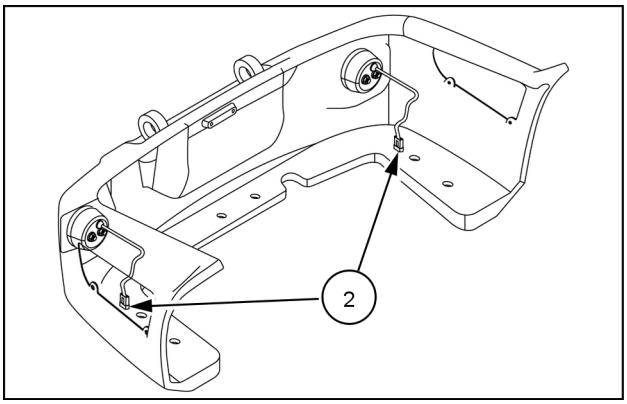
Rear driving lights

1. Locate the rear driving lights **(1)**.



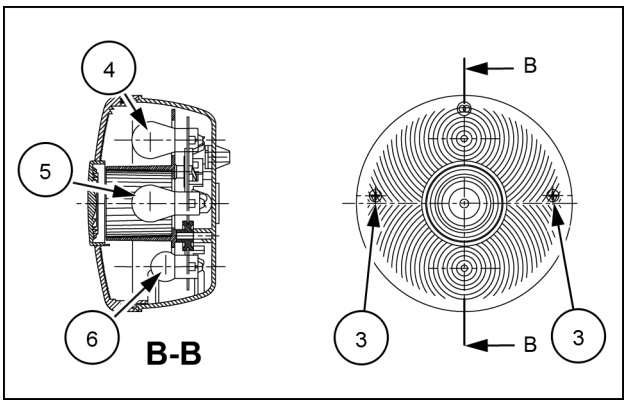
LEIL15CWL0104AA 6

2. Disconnect the connectors **(2)**.



LEIL15CWL0329AA 7

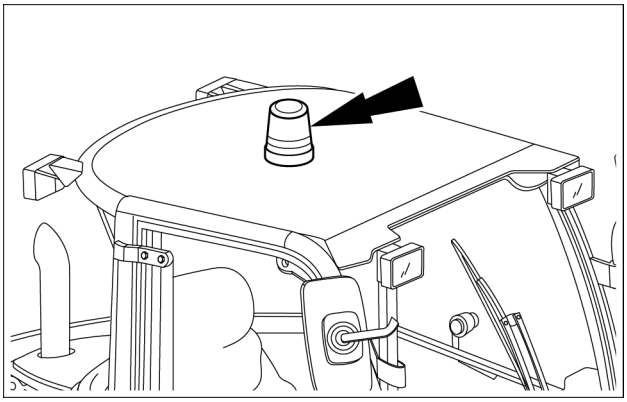
3. Remove the screws **(3)** to remove the external cover of the rear light.
4. Replace the bulbs of the stop light **(4)** direction light **(5)** and position light **(6)** with corresponding bulbs of the same wattage.



LEIL15CWL0328AB 8

Rotary beacon

Remove the cover.
Extract the defective bulb and install a new one.
Reinstall the cover.

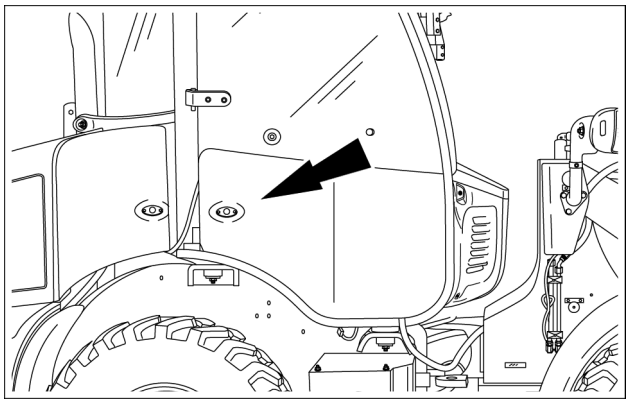


LEIL15CWL0324AB 9

Fuses and relays

Prior operation:
Keep all non-authorized personnel clear of the area. Park the machine on level ground in neutral, with the parking brake applied and the attachment lowered to the ground. Install the safety pin into the lock position, so that the articulation joint is locked.

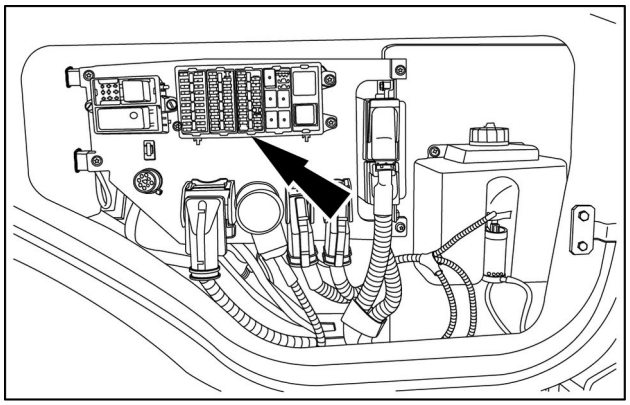
1. The fuse and relay access door is located on the right-hand side of the machine.
   Open the fuse access door to access the fuses.



LEIL14CWL0490AA 1

2. When required, extract the faulty fuse and insert a new fuse with the same charge.
   Before replacing fuses, turn the ignition key to the OFF (shut down) position.

NOTICE: *never replace a fuse with a fuse of a different amperage.*



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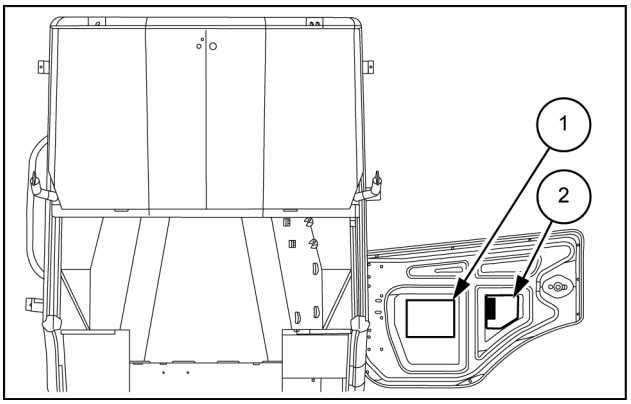
3. Refer to the fuse decals for correct location of each fuse. The fuse decals are located inside the fuse and relay access door:
   1. Fuse and relay decal
   2. Front electrical fuse decal (optional)



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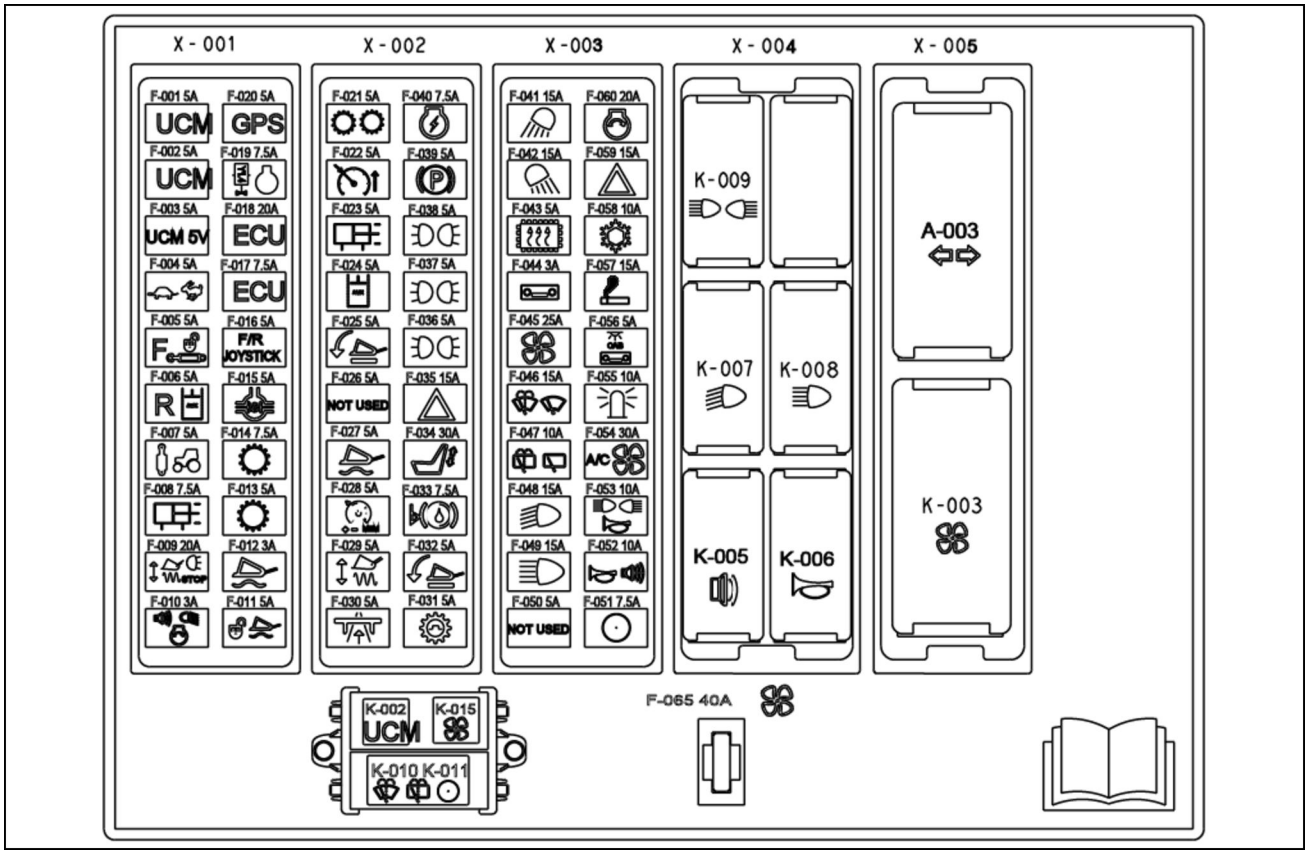
Fuses

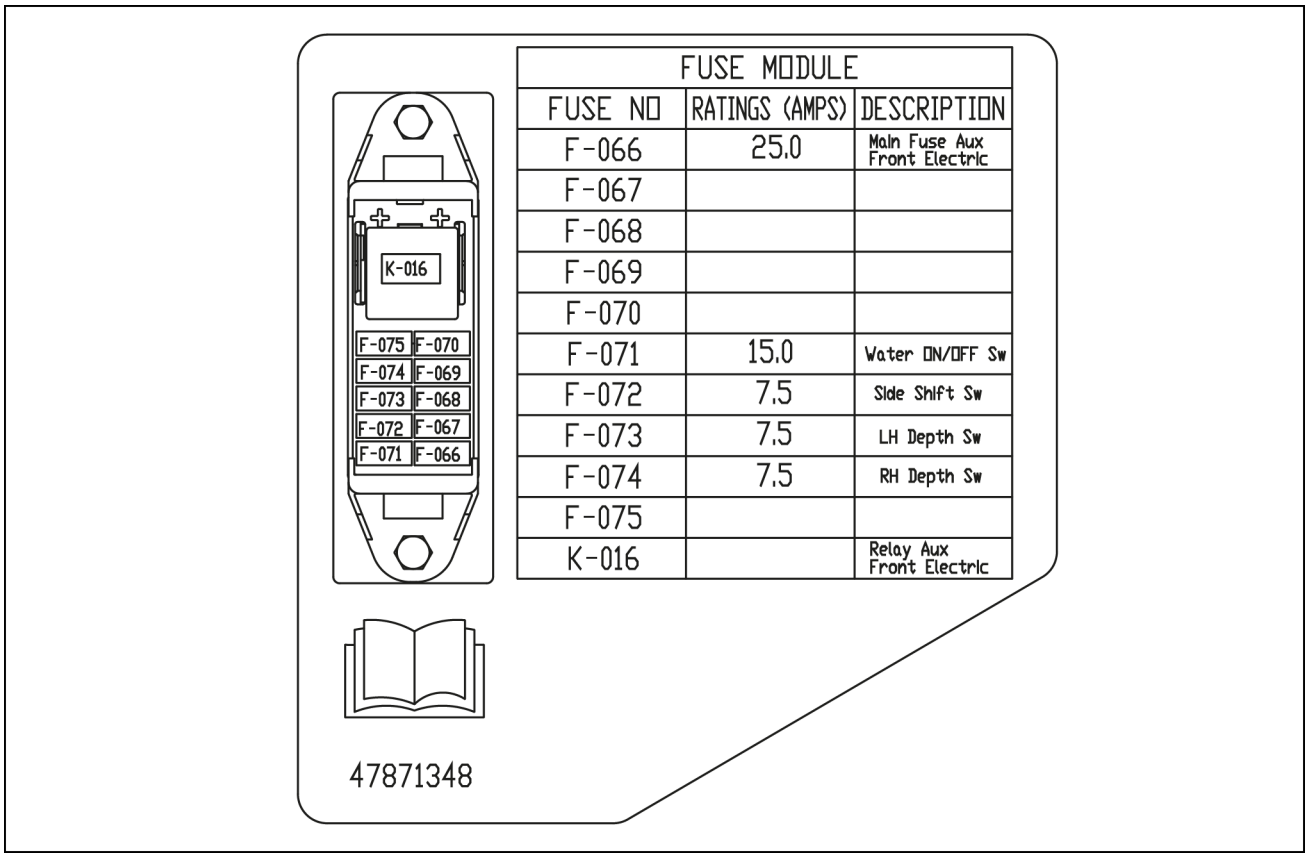


LEIL14CWL0632FA 4

Fuse number	Description	Ampere A
F-001	UCM unswitched power	**5 A**
F-002	UCM wake up signal	**5 A**
F-003	Out **5 V** sensors	**5 A**
F-004	Pump displacement and turtle/rabbit solenoid	**5 A**
F-005	Main Pilot and Forward solenoid	**5 A**
F-006	High flow and Reverse solenoid.	**5 A**
F-007	3rd function solenoid	**5 A**
F-008	RTD activation and Quick coupler solenoid	**7.5 A**
F-009	Stop light/Ride Control and 3rd/4th selection solenoid	**20 A**
F-010	Gear/Creep Speed/High flow LEDs ECU crank and backup alarm relays	**3 A**
F-011	Ride Control unlock 2 and High flow action. solenoid	**5 A**
F-012	Floating solenoid	**3 A**
F-013	2nd speed gear solenoid	**5 A**
F-014	1st speed gear and Ride Control unlock 1 solenoid	**7.5 A**
F-015	Direction travel and Differential lock solenoid	**5 A**
F-016	Joystick switches	**5 A**
F-017	ECU fuse 1	**7.5 A**
F-018	ECU fuse 2	**20 A**
F-019	Engine sensors	**7.5 A**
F-020	Telematics unit	**5 A**
F-021	1st/2nd gear switch	**5 A**
F-022	Creep Speed switch	**5 A**
F-023	Quick Coupler switch	**5 A**
F-024	High flow sitch	**5 A**
F-025	Return-to-dig switch	**5 A**
F-026	Not used	**5 A**

Fuse number	Description	Ampere A
F-027	Floating switch	**5 A**
F-028	Creep Speed PLUS/MINUS/MEM switch	**5 A**
F-029	Ride Control switch	**5 A**
F-030	Main hydraulic switch	**5 A**
F-031	Transmission speed sensor	**5 A**
F-032	Return-to-dig proximity sensor	**5 A**
F-033	Cluster wake-up and brake fluid level	**7.5 A**
F-034	Seat air suspension	**30 A**
F-035	+15 hazard switch	**15 A**
F-036	Left-hand front/Right-hand rear road lights	**5 A**
F-037	Right-hand front/Left-hand rear road lights and number plate light	**5 A**
F-038	Cab switches backlight	**5 A**
F-039	Hand brake switch	**5 A**
F-040	ECU ignition signal	**7.5 A**
F-041	Front work lights	**15 A**
F-042	Rear work lights	**15 A**
F-043	Air–conditioning control unit	**5 A**
F-044	Radio	**3 A**
F-045	Air-conditioning and fan motor switch	**25 A**
F-046	Front wiper motor	**15 A**
F-047	Rear wiper motor	**10 A**
F-048	Low beam head lights	**15 A**
F-049	High beam head lights	**15 A**
F-050	Not used	**5 A**
F-051	+30 instrument cluster and diagnostic connector	**7.5 A**
F-052	Horn and back-up alarm	**10 A**
F-053	Multifunction lever (lights and horn)	**10 A**
F-054	Fan condenser	**30 A**
F-055	Beacon light switch	**10 A**
F-056	Dome lamp and radio	**5 A**
F-057	Cigar lighter	**15 A**
F-058	Air-conditioning clutch relay	**10 A**
F-059	+30 warning switch	**15 A**
F-060	Crank signal	**20 A**
F-061	CAB power	**100 A**
F-062	GCU	**60 A**
F-063	Telematics	**20 A**
F-064	ECU main relay fuse	**40 A**
F-065	4th speed blower fuse	**40 A**

Front electrical socket fuses (optional)



47871348 5

Fuse number	Description	Ampere A
F-066	Auxiliary front electrical main fuse	**25 A**
F-067	–	**5 A**
F-068	–	–
F-069	–	–
F-070	–	–
F-071	Water ON/OFF switch	**15 A**
F-072	Side shift switch	**7.5 A**
F-073	Left-hand depth switch	**7.5 A**
F-074	Right-hand depth switch	**7.5 A**
F-075	–	–
K-016	Auxiliary front electrical relay	

Storage

Preparation

Preparation for storage

The following procedure applies when the machine is to be stored for a month or more. Store the machine on firm, level ground, inside a building or, if not possible, outside and covered with a tarpaulin. Before storing the machine, carry out the following operations:

1. Clean the machine.
2. Retract the arm cylinder rod as far as possible, and lower the boom until the attachment is resting on the ground.
3. Grease the machine thoroughly. The exposed surfaces of the cylinder rods should be greased or covered with a protective film. See your CASE CONSTRUCTION dealer.

NOTE: *when the machine resumes service, the film will disappear automatically*

1. Drain the fuel tank, and fill with a mixture of 90% diesel fuel and 10% anti-corrosive oil. Run the engine at idle speed for five minutes to allow the anti-corrosive oil to reach the lines, filters, pump and injectors.
2. While the engine is still warm, drain the oil sump, fill with anti-corrosive oil, and replace the engine oil filter.
3. When the engine is cold, clean the outer parts of the engine with diesel fuel.
4. Clean or replace the air filter element.
5. Drain the cooling system, leave the drain valves open, and do not tighten the radiator cap.
6. Grease the cylinder rods.
7. Remove the batteries, clean the battery housings. Store the batteries safely in a cool and dry location, where the temperature will be higher than **0 °C** (**32.0 °F**).
8. Paint any areas where the paint shows signs of deterioration.
9. Plug the air filter inlet and the exhaust pipe.
10. Remove the starter switch key and place a "DO NOT OPERATE" label on the right-hand control arm.
11. Lock the hoods and the cab door.

Every 30 days

Periodic checks

Every month, check:

1. The battery charge. Recharge the batteries if required.
2. The grease on the cylinder rods and/or perform attachment functions monthly.
3. The fuel level in the fuel tank and the corrosive oil level in the engine. Add more if necessary.
4. The condition of all lines, connectors and clamps (rust). Grease if necessary.
5. The condition of the paint work. Apply a coat of anti-rust treatment where necessary.

Removal

Starting up after storage

⚠ WARNING

Inhalation hazard! Risk to operators and bystanders.
Avoid running the engine in confined areas. Make sure there is adequate ventilation at all times.
Failure to comply could result in death or serious injury.

W0156A

1. Close the drain valves and fill the cooling system.
2. Drain the fuel reservoir and top up with suitable fuel, see "Fluids and Lubricants" section in this manual.
3. Drain the engine sump, fill with clean engine oil and check the oil level.
4. Replace the filtering element of the fuel filters.
5. Install the batteries.
6. Grease the machine thoroughly.
7. Check the condition of the engine accessory drive belt, and replace it if necessary.
8. Check the condition of the air conditioning drive belt and replace it if necessary.
9. Check the hydraulic fluid level, and add more fluid if necessary.
10. Check the travel reduction gears and swing reduction gear oil level, and add more oil if necessary.
11. Clean the cylinder rods.
12. Unplug the air filter inlet and the exhaust pipe.
13. Remove the "DO NOT OPERATE" tag and start the engine, following the starting up procedure. Keep non-authorized personnel clear of the machine.
14. Keep a careful watch on all systems display panel lamps and indicators.

8 - SPECIFICATIONS

General specifications

21F

21F - Engine specifications

Model	FPT F5HFL463B, Tier4 certified
Type	4-stroke, diesel engine (direct injection)
Cylinders	4
Bore / Stroke	**99 mm** (**3.9 in**) x **110 mm** (**4.3 in**)
Displacement	**3.4 L** (**0.9 US gal**)
Fuel Injection	Electronic
Aspiration	Turbocharged (with Waste Gate)
Rated power (**SAE J1349**)	
Gross	**43 kW** (**58 Hp**) @ **2500 RPM**
Net	**41 kW** (**56 Hp**) @ **2500 RPM**
Torque (maximum)	
Peak torque	**245 N·m** (**181 lb ft**) @ **2500 RPM**
Engine speeds	
High idle	**2475 – 2525 RPM** (no load)
Rated	**2475 – 2525 RPM** (full load)
Low idle	**925 – 975 RPM**
Electrical	
Batteries	standard: **12 V**, **95 A·h**, **900 A** weather package (quantity 2): **12 V**, **74 A·h**, **680 A**
Alternator	**14 V**, **120 A**
Voltage	**12 V**

21F - Drive line

Gearbox		
Installation	Flanged on rear axle	
Number of speeds	1	
Axles	Front	Rear
Differential type	Open Limited slip	Open Limited slip
Service brakes	One brake disc and hydraulic caliper on the input axle. Hydraulic foot operated.	-
Parking brake	One brake disc and mechanical caliper on the input axle. Mechanically actuated.	-
Rear axle oscillation	-	+ (-) **9°**
Machine speeds		
1st	**5 km/h** (**3.1 mph**)	
2nd	**20 km/h** (**12.4 mph**)	

21F - Hydraulic specifications

Hydrostatic pump	A tandem variable displacement piston pump which supplies oil to hydrostatic motor
Displacement (variable)	**40 cm³/rev** (**2.4 in³/rev**) **100 L/min** (**26.4 US gpm**) @ **2500 RPM**
Hydrostatic motor	A variable displacement piston motor which receives oil from hydrostatic pump to move gears of transmission
Displacement (variable)	**80.0 cm³/rev** (**4.9 in³/rev**) **200 L/min** (**52.8 US gpm**) @ **2500 RPM**
Loader pump	A tandem fixed displacement gear pump which supplies oil to the integrated steering/loader hydraulic system
Displacement (fixed)	**26.7 cm³/rev** (**1.6 in³/rev**) **66.75 L/min** (**17.63 US gpm**) @ **2500 RPM**

Instrumentation gauges

Engine RPM	Dot Matrix Display (DMD)	Clock
Engine Coolant Temperature (ECT)	After Treatment System (ATS) icons	Error codes
Fuel level	Travel selected (FNR)	Vehicle speed
Hourmeter	Gear engaged	Hydraulic functions

Operator compartment

ROPS cab with heater	Key start	Articulated power steering with tilt
Cab with air conditioning	Front sun screen	Cup holder
Adjustable suspension seat	Front (intermittent) and rear wipers	Single brake pedal
Coat hook	Retractable seat belt	Foot throttle
Storage tray	Cellular phone pocket	Dome light
Exterior rear view mirrors		Single lever electronic speed shift control, F-N-R switch in loader control handle

121F

121F - Engine specifications

Model	FPT F5HFL463C, Tier4 certified
Type	4-stroke, diesel engine (direct injection)
Cylinders	4
Bore / Stroke	**99 mm** (**3.9 in**) x **110 mm** (**4.3 in**)
Displacement	**3.4 L** (**0.9 US gal**)
Fuel Injection	Electronic
Aspiration	Turbocharged (with Waste Gate)
Rated power (**SAE J1349**)	
Gross	**48 kW** (**65 Hp**) @ **2500 RPM**
Net	**45 kW** (**61 Hp**) @ **2500 RPM**
Torque (maximum)	
Peak torque	**261 N·m** (**193 lb ft**) @ **2500 RPM**
Engine speeds	
High idle	**2475 – 2525 RPM** (no load)
Rated	**2475 – 2525 RPM** (full load)
Low idle	**925 – 975 RPM**
Electrical	
Batteries	standard: **12 V**, **95 A·h**, **900 A** weather package (quantity 2): **12 V**, **74 A·h**, **680 A**
Alternator	**14 V**, **120 A**
Voltage	**12 V**

121F - Drive line

Gearbox		
Installation	Flanged on rear axle	
Number of speeds	1	
Axles	Front	Rear
Differential type	Open Limited slip	Open Limited slip
Service brakes	One brake disc and hydraulic caliper on the input axle. Hydraulic foot operated.	-
Parking brake	One brake disc and mechanical caliper on the input axle. Mechanically actuated.	-
Rear axle oscillation	-	+ (-) **9°**
Machine speeds		
1st	**5 km/h** (**3.1 mph**)	
2nd	**20 km/h** (**12.4 mph**)	

121F - Hydraulic specifications

Hydrostatic pump	A tandem variable displacement piston pump which supplies oil to hydrostatic motor
Displacement (variable)	**40 cm³/rev** (**2.4 in³/rev**) **100 L/min** (**26.4 US gpm**) @ **2500 RPM**
Hydrostatic motor	A variable displacement piston motor which receives oil from hydrostatic pump to move gears of transmission
Displacement (variable)	**80.0 cm³/rev** (**4.9 in³/rev**) **200 L/min** (**52.8 US gpm**) @ **2500 RPM**
Loader pump	A tandem fixed displacement gear pump which supplies oil to the integrated steering/loader hydraulic system
Displacement (fixed)	**26.7 cm³/rev** (**1.6 in³/rev**) **66.75 L/min** (**17.63 US gpm**) @ **2500 RPM**

Instrumentation gauges

Engine RPM	Dot Matrix Display (DMD)	Clock
Engine Coolant Temperature (ECT)	After Treatment System (ATS) icons	Error codes
Fuel level	Travel selected (FNR)	Vehicle speed
Hourmeter	Gear engaged	Hydraulic functions

Operator compartment

ROPS cab with heater	Key start	Articulated power steering with tilt
Cab with air conditioning	Front sun screen	Cup holder
Adjustable suspension seat	Front (intermittent) and rear wipers	Single brake pedal
Coat hook	Retractable seat belt	Foot throttle
Storage tray	Cellular phone pocket	Dome light
Exterior rear view mirrors		Single lever electronic speed shift control, F-N-R switch in loader control handle

221F

221F - Engine specifications

Model	FPT F5HFL463A, Tier4 certified
Type	4-stroke, diesel engine (direct injection)
Cylinders	4
Bore / Stroke	**99 mm** (**3.9 in**) x **110 mm** (**4.3 in**)
Displacement	**3.4 L** (**0.9 US gal**)
Fuel Injection	Electronic
Aspiration	Turbocharged (with Waste Gate)
Rated power (**SAE J1349**)	
Gross	**55 kW** (**75 Hp**) @ **2500 RPM**
Net	**52 kW** (**71 Hp**) @ **2500 RPM**
Torque (maximum)	
Peak torque	**316 N·m** (**233 lb ft**) @ **2500 RPM**
Engine speeds	
High idle	**2475 – 2525 RPM** (no load)
Rated	**2475 – 2525 RPM** (full load)
Low idle	**925 – 975 RPM**
Electrical	
Batteries	standard: **12 V**, **95 A·h**, **900 A** weather package (quantity 2): **12 V**, **74 A·h**, **680 A**
Alternator	**14 V**, **120 A**
Voltage	**12 V**

221F - Drive line

Gearbox	221F standard	221F High Speed
Installation	Flanged on rear axle	
Number of speeds	1	2
Axles	Front	Rear
Differential type	Open Limited slip 100% lock	Open Limited slip 100% lock
Service brakes	1+1 wet brake outboard. Hydraulic foot operated.	-
Parking brake	One brake disc and mechanical caliper on the input axle. Mechanically actuated.	-
Rear axle oscillation	-	+ (-) **10°**
Machine speeds	221F standard	221F High Speed
1st	**5.3 km/h** (**3.3 mph**)	**4.8 km/h** (**3 mph**)
2nd	**18.3 km/h** (**11.4 mph**)	**13 km/h** (**8.1 mph**)
3rd	-	**30 km/h** (**18.6 mph**)

221F - Hydraulic specifications

Hydrostatic pump	A tandem variable displacement piston pump which supplies oil to hydrostatic motor
Displacement (variable)	**56 cm³/rev** (**3.4 in³/rev**) **140 L/min** (**37 US gpm**) @ **2500 RPM**
Hydrostatic motor	A variable displacement piston motor which receives oil from hydrostatic pump to move gears of transmission
Displacement (variable)	**80 cm³/rev** (**4.9 in³/rev**) **200 L/min** (**52.8 US gpm**) @ **2500 RPM**
Loader pump	A tandem fixed displacement gear pump which supplies oil to the integrated steering/loader hydraulic system
Displacement (fixed)	**34 cm³/rev** (**2.1 in³/rev**) **85 L/min** (**22.5 US gpm**) @ **2500 RPM**
High Flow pump	A tandem fixed displacement gear pump which supplies oil to High Flow Valve and related attachment
Displacement (fixed)	**19 cm³/rev** (**1.2 in³/rev**) **45 L/min** (**11.9 US gpm**) @ **2500 RPM**

Instrumentation gauges

Engine RPM	Dot Matrix Display (DMD)	Clock
Engine Coolant Temperature (ECT)	After Treatment System (ATS) icons	Error codes
Fuel level	Travel selected (FNR)	Vehicle speed
Hourmeter	Gear engaged	Hydraulic functions

Operator compartment

ROPS cab with heater	Key start	Articulated power steering with tilt
Cab with air conditioning	Front sun screen	Cup holder
Adjustable suspension seat	Front (intermittent) and rear wipers	Single brake pedal
Coat hook	Retractable seat belt	Foot throttle
Storage tray	Cellular phone pocket	Dome light
Exterior rear view mirrors		Single lever electronic speed shift control, F-N-R switch in loader control handle

321F

321F - Engine specifications

Model	FPT F5HFL463A, Tier 4 certified
Type	4-stroke, diesel engine (direct injection)
Cylinders	4
Bore / Stroke	**99 mm** (**3.9 in**) x **110 mm** (**4.3 in**)
Displacement	**3.4 L** (**0.9 US gal**)
Fuel Injection	Electronic
Aspiration	Turbocharged (with Waste Gate)
Rated power (**SAE J1349**)	
Gross	**55 kW** (**75 Hp**) @ **2500 RPM**
Net	**52 kW** (**71 Hp**) @ **2500 RPM**
Torque (maximum)	
Peak torque	**316 N·m** (**233 lb ft**) @ **2500 RPM**
Engine speeds	
High idle	**2475 – 2525 RPM** (no load)
Rated	**2475 – 2525 RPM** (full load)
Low idle	**925 – 975 RPM**
Electrical	
Batteries	standard: **12 V**, **95 A·h**, **900 A** weather package (quantity 2): **12 V**, **74 A·h**, **680 A**
Alternator	**14 V**, **120 A**
Voltage	**12 V**

321F - Drive line

Gearbox	321F standard	321F High Speed
Installation	Flanged on rear axle	
Number of speeds	1	2
Axles	Front	Rear
Differential type	Open Limited slip 100% lock	Open Limited slip 100% lock
Service brakes	1+1 wet brake outboard. Hydraulic foot operated.	-
Parking brake	One brake disc and mechanical caliper on the input axle. Mechanically actuated.	-
Rear axle oscillation	-	+ (-) **10°**
Machine speeds	321F standard	321F High Speed
1st	**6 km/h** (**3.7 mph**)	**5.3 km/h** (**3.3 mph**)
2nd	**20 km/h** (**12.4 mph**)	**14.4 km/h** (**8.9 mph**)
3rd	-	**33.1 km/h** (**20.6 mph**)

321F - Hydraulic specifications

Hydrostatic pump	A tandem variable displacement piston pump which supplies oil to hydrostatic motor
Displacement (variable)	**56 cm³/rev** (**3.4 in³/rev**) **140 L/min** (**37 US gpm**) @ **2500 RPM**
Hydrostatic motor	A variable displacement piston motor which receives oil from hydrostatic pump to move gears of transmission
Displacement (variable)	**80 cm³/rev** (**4.9 in³/rev**) **200 L/min** (**52.8 US gpm**) @ **2500 RPM**
Loader pump	A tandem fixed displacement gear pump which supplies oil to the integrated steering/loader hydraulic system
Displacement (fixed)	**34 cm³/rev** (**2.1 in³/rev**) **85 L/min** (**22.5 US gpm**) @ **2500 RPM**
High Flow pump	A tandem fixed displacement gear pump which supplies oil to High Flow Valve and related attachment
Displacement (fixed)	**19 cm³/rev** (**1.2 in³/rev**) **45 L/min** (**11.9 US gpm**) @ **2500 RPM**

Instrumentation gauges

Engine RPM	Dot Matrix Display (DMD)	Clock
Engine Coolant Temperature (ECT)	After Treatment System (ATS) icons	Error codes
Fuel level	Travel selected (FNR)	Vehicle speed
Hourmeter	Gear engaged	Hydraulic functions

Operator compartment

ROPS cab with heater	Key start	Articulated power steering with tilt
Cab with air conditioning	Front sun screen	Cup holder
Adjustable suspension seat	Front (intermittent) and rear wipers	Single brake pedal
Coat hook	Retractable seat belt	Foot throttle
Storage tray	Cellular phone pocket	Dome light
Exterior rear view mirrors		Single lever electronic speed shift control, F-N-R switch in loader control handle

Lift capacities

A table of the acronyms used in this section, is reported.

Bucket acronyms	
Acronym	Definition
GP	General Purpose
LM	Light Material
MP (4x1)	Multi Purpose (4x1)
Quick Coupler acronyms	
Acronym	Definition
HP	Horizontal Pin
SSL	Skid Steer Loader

21F Model configurations

The following table lists hydraulic lift capacities for lift applications of the 21F Z-Bar equipped with rear standard counterweight:

	Naked bucket	Bucket w/cutting edge	Bucket w/teeth
21F Z-Bar Specifications - **0.7 m³** (**0.92 yd³**) GP Bucket on HP Quick Coupler			
Full height	**3278 kg** (**7227 lb**)	**3221 kg** (**7101 lb**)	**3247 kg** (**7158 lb**)
Maximum reach	**4173 kg** (**9200 lb**)	**4116 kg** (**9074 lb**)	**4143 kg** (**9134 lb**)
Ground	**5293 kg** (**11669 lb**)	**5239 kg** (**11550 lb**)	**5265 kg** (**11607 lb**)
21F Z-Bar Specifications - **1.0 m³** (**1.31 yd³**) LM Bucket on HP Quick Coupler			
Full height	**3231 kg** (**7123 lb**)	**3171 kg** (**6991 lb**)	**3199 kg** (**7053 lb**)
Maximum reach	**4126 kg** (**9096 lb**)	**4066 kg** (**8964 lb**)	**4094 kg** (**9026 lb**)
Ground	**5175 kg** (**11409 lb**)	**5118 kg** (**11283 lb**)	**5144 kg** (**11341 lb**)
21F Z-Bar Specifications - **0.7 m³** (**0.92 yd³**) MP (4x1) Bucket on HP Quick Coupler			
Full height	**2953 kg** (**6510 lb**)	**2893 kg** (**6378 lb**)	**2921 kg** (**6440 lb**)
Maximum reach	**3848 kg** (**8483 lb**)	**3788 kg** (**8351 lb**)	**3816 kg** (**8413 lb**)
Ground	**4969 kg** (**10955 lb**)	**4910 kg** (**10825 lb**)	**4938 kg** (**10886 lb**)
21F Z-Bar Specifications - **0.7 m³** (**0.92 yd³**) GP Bucket on SSL Quick Coupler			
Full height	**3264 kg** (**7196 lb**)	**3207 kg** (**7070 lb**)	**3234 kg** (**7130 lb**)
Maximum reach	**4158 kg** (**9167 lb**)	**4101 kg** (**9041 lb**)	**4128 kg** (**9101 lb**)
Ground	**5030 kg** (**11089 lb**)	**4976 kg** (**10970 lb**)	**5002 kg** (**11028 lb**)
21F Z-Bar Specifications - **1.0 m³** (**1.31 yd³**) LM Bucket on SSL Quick Coupler			
Full height	**3214 kg** (**7086 lb**)	**3155 kg** (**6956 lb**)	**3187 kg** (**7026 lb**)
Maximum reach	**4106 kg** (**9052 lb**)	**4046 kg** (**8920 lb**)	**4078 kg** (**8990 lb**)
Ground	**4949 kg** (**10911 lb**)	**4892 kg** (**10785 lb**)	**4920 kg** (**10847 lb**)
21F Z-Bar Specifications - **0.7 m³** (**0.92 yd³**) MP (4x1) Bucket on SSL Quick Coupler			
Full height	**2953 kg** (**6510 lb**)	**2893 kg** (**6378 lb**)	**2921 kg** (**6440 lb**)
Maximum reach	**3846 kg** (**8479 lb**)	**3786 kg** (**8347 lb**)	**3814 kg** (**8408 lb**)
Ground	**4730 kg** (**10428 lb**)	**4673 kg** (**10302 lb**)	**4700 kg** (**10362 lb**)

The following table lists hydraulic lift capacities for lift applications of the 21F XT equipped with rear standard counterweight:

	Naked bucket	Bucket w/cutting edge	Bucket w/teeth
21F XT Specifications - **0.7 m³** (**0.92 yd³**) GP Bucket on HP Quick Coupler			
Full height	**2514 kg** (**5542 lb**)	**2474 kg** (**5454 lb**)	**2493 kg** (**5496 lb**)
Maximum reach	**2785 kg** (**6140 lb**)	**2743 kg** (**6047 lb**)	**2763 kg** (**6091 lb**)
Ground	**3000 kg** (**6614 lb**)	**2962 kg** (**6530 lb**)	**2981 kg** (**6572 lb**)
21F XT Specifications - **0.8 m³** (**1.05 yd³**) LM Bucket on HP Quick Coupler			
Full height	**2543 kg** (**5606 lb**)	**2497 kg** (**5505 lb**)	**2518 kg** (**5551 lb**)
Maximum reach	**2720 kg** (**5997 lb**)	**2676 kg** (**5900 lb**)	**2696 kg** (**5944 lb**)
Ground	**2926 kg** (**6451 lb**)	**2883 kg** (**6356 lb**)	**2903 kg** (**6400 lb**)
21F XT Specifications - **0.7 m³** (**0.92 yd³**) MP (4x1) Bucket on HP Quick Coupler			
Full height	**2335 kg** (**5148 lb**)	**2289 kg** (**5046 lb**)	**2311 kg** (**5095 lb**)
Maximum reach	**2504 kg** (**5520 lb**)	**2459 kg** (**5421 lb**)	**2480 kg** (**5467 lb**)
Ground	**2721 kg** (**5999 lb**)	**2677 kg** (**5902 lb**)	**2697 kg** (**5946 lb**)
21F XT Specifications - **0.7 m³** (**0.92 yd³**) GP Bucket on SSL Quick Coupler			
Full height	**2421 kg** (**5337 lb**)	**2378 kg** (**5243 lb**)	**2398 kg** (**5287 lb**)
Maximum reach	**2715 kg** (**5986 lb**)	**2671 kg** (**5889 lb**)	**2691 kg** (**5933 lb**)
Ground	**2897 kg** (**6387 lb**)	**2854 kg** (**6292 lb**)	**2874 kg** (**6336 lb**)
21F XT Specifications - **0.8 m³** (**1.05 yd³**) LM Bucket on SSL Quick Coupler			
Full height	**2365 kg** (**5214 lb**)	**2322 kg** (**5119 lb**)	**2342 kg** (**5163 lb**)
Maximum reach	**2666 kg** (**5878 lb**)	**2621 kg** (**5778 lb**)	**2642 kg** (**5825 lb**)
Ground	**2828 kg** (**6235 lb**)	**2785 kg** (**6140 lb**)	**2805 kg** (**6184 lb**)
21F XT Specifications - **0.7 m³** (**0.92 yd³**) MP (4x1) Bucket on SSL Quick Coupler			
Full height	**2143 kg** (**4725 lb**)	**2100 kg** (**4630 lb**)	**2120 kg** (**4674 lb**)
Maximum reach	**2429 kg** (**5355 lb**)	**2384 kg** (**5256 lb**)	**2405 kg** (**5302 lb**)
Ground	**2602 kg** (**5736 lb**)	**2558 kg** (**5639 lb**)	**2580 kg** (**5688 lb**)

121F Model configurations

The following table lists hydraulic lift capacities for lift applications of the 121F Z-Bar equipped with rear standard counterweight:

	Naked bucket	Bucket w/cutting edge	Bucket w/teeth
121F Z-Bar Specifications - **0.8 m³** (**1.05 yd³**) GP Bucket on HP Quick Coupler			
Full height	**3146 kg** (**6936 lb**)	**3089 kg** (**6810 lb**)	**3116 kg** (**6870 lb**)
Maximum reach	**3999 kg** (**8816 lb**)	**3942 kg** (**8691 lb**)	**3969 kg** (**8750 lb**)
Ground	**5145 kg** (**11343 lb**)	**5089 kg** (**11219 lb**)	**5115 kg** (**11277 lb**)
121F Z-Bar Specifications - **1.1 m³** (**1.44 yd³**) LM Bucket on HP Quick Coupler			
Full height	**3098 kg** (**6830 lb**)	**3038 kg** (**6698 lb**)	**3066 kg** (**6759 lb**)
Maximum reach	**3972 kg** (**8757 lb**)	**3912 kg** (**8624 lb**)	**3940 kg** (**8686 lb**)
Ground	**5063 kg** (**11162 lb**)	**5008 kg** (**11041 lb**)	**5034 kg** (**11098 lb**)
121F Z-Bar Specifications - **0.8 m³** (**1.05 yd³**) MP (4x1) Bucket on HP Quick Coupler			
Full height	**2810 kg** (**6195 lb**)	**2750 kg** (**6063 lb**)	**2778 kg** (**6124 lb**)
Maximum reach	**3683 kg** (**8120 lb**)	**3623 kg** (**7987 lb**)	**3651 kg** (**8049 lb**)
Ground	**4823 kg** (**10633 lb**)	**4766 kg** (**10507 lb**)	**4793 kg** (**10567 lb**)
121F Z-Bar Specifications - **0.8 m³** (**1.05 yd³**) GP Bucket on SSL Quick Coupler			
Full height	**3140 kg** (**6923 lb**)	**3083 kg** (**6797 lb**)	**3109 kg** (**6854 lb**)
Maximum reach	**3973 kg** (**8759 lb**)	**3917 kg** (**8636 lb**)	**3942 kg** (**8691 lb**)
Ground	**4954 kg** (**10922 lb**)	**4900 kg** (**10803 lb**)	**4924 kg** (**10856 lb**)
121F Z-Bar Specifications - **1.1 m³** (**1.44 yd³**) LM Bucket on SSL Quick Coupler			
Full height	**3092 kg** (**6817 lb**)	**3035 kg** (**6691 lb**)	**3060 kg** (**6746 lb**)
Maximum reach	**3926 kg** (**8655 lb**)	**3870 kg** (**8532 lb**)	**3894 kg** (**8585 lb**)
Ground	**4885 kg** (**10770 lb**)	**4827 kg** (**10642 lb**)	**4855 kg** (**10703 lb**)
121F Z-Bar Specifications - **0.8 m³** (**1.05 yd³**) MP (4x1) Bucket on SSL Quick Coupler			
Full height	**2823 kg** (**6224 lb**)	**2763 kg** (**6091 lb**)	**2791 kg** (**6153 lb**)
Maximum reach	**3657 kg** (**8062 lb**)	**3597 kg** (**7930 lb**)	**3625 kg** (**7992 lb**)
Ground	**4646 kg** (**10243 lb**)	**4588 kg** (**10115 lb**)	**4615 kg** (**10174 lb**)

The following table lists hydraulic lift capacities for lift applications of the 121F XT equipped with rear standard counterweight:

	Naked bucket	Bucket w/cutting edge	Bucket w/teeth
121F XT Specifications - **0.8 m³** (**1.05 yd³**) GP Bucket on HP Quick Coupler			
Full height	**2478 kg** (**5463 lb**)	**2438 kg** (**5375 lb**)	**2457 kg** (**5417 lb**)
Maximum reach	**2746 kg** (**6054 lb**)	**2703 kg** (**5959 lb**)	**2723 kg** (**6003 lb**)
Ground	**2950 kg** (**6504 lb**)	**2908 kg** (**6411 lb**)	**2927 kg** (**6453 lb**)
121F XT Specifications - **1.1 m³** (**1.44 yd³**) LM Bucket on HP Quick Coupler			
Full height	**2406 kg** (**5304 lb**)	**2365 kg** (**5214 lb**)	**2384 kg** (**5256 lb**)
Maximum reach	**2675 kg** (**5897 lb**)	**2632 kg** (**5803 lb**)	**2652 kg** (**5847 lb**)
Ground	**2832 kg** (**6243 lb**)	**2792 kg** (**6155 lb**)	**2811 kg** (**6197 lb**)
121F XT Specifications - **0.8 m³** (**1.05 yd³**) MP (4x1) Bucket on HP Quick Coupler			
Full height	**2198 kg** (**4846 lb**)	**2153 kg** (**4747 lb**)	**2174 kg** (**4793 lb**)
Maximum reach	**2485 kg** (**5478 lb**)	**2440 kg** (**5379 lb**)	**2461 kg** (**5426 lb**)
Ground	**2688 kg** (**5926 lb**)	**2644 kg** (**5829 lb**)	**2665 kg** (**5875 lb**)
121F XT Specifications - **0.8 m³** (**1.05 yd³**) GP Bucket on SSL Quick Coupler			
Full height	**2410 kg** (**5313 lb**)	**2370 kg** (**5225 lb**)	**2388 kg** (**5265 lb**)
Maximum reach	**2694 kg** (**5939 lb**)	**2652 kg** (**5847 lb**)	**2672 kg** (**5891 lb**)
Ground	**2850 kg** (**6283 lb**)	**2810 kg** (**6195 lb**)	**2829 kg** (**6237 lb**)
121F XT Specifications - **1.1 m³** (**1.44 yd³**) LM Bucket on SSL Quick Coupler			
Full height	**2344 kg** (**5168 lb**)	**2303 kg** (**5077 lb**)	**2322 kg** (**5119 lb**)
Maximum reach	**2629 kg** (**5796 lb**)	**2586 kg** (**5701 lb**)	**2606 kg** (**5745 lb**)
Ground	**2748 kg** (**6058 lb**)	**2708 kg** (**5970 lb**)	**2726 kg** (**6010 lb**)
121F XT Specifications - **0.8 m³** (**1.05 yd³**) MP (4x1) Bucket on SSL Quick Coupler			
Full height	**2123 kg** (**4680 lb**)	**2079 kg** (**4583 lb**)	**2099 kg** (**4628 lb**)
Maximum reach	**2425 kg** (**5346 lb**)	**2381 kg** (**5249 lb**)	**2401 kg** (**5293 lb**)
Ground	**2583 kg** (**5695 lb**)	**2540 kg** (**5600 lb**)	**2560 kg** (**5644 lb**)

221F Model configurations

The following table lists hydraulic lift capacities for lift applications of the 221F Z-Bar equipped with rear standard counterweight:

	Naked bucket	Bucket w/cutting edge	Bucket w/teeth
221F Z-Bar Specifications - **0.9 m³** (**1.2 yd³**) GP Bucket on HP Quick Coupler			
Full height	**3841 kg** (**8468 lb**)	**3782 kg** (**8338 lb**)	**3809 kg** (**8397 lb**)
Maximum reach	**4883 kg** (**10765 lb**)	**4824 kg** (**10635 lb**)	**4852 kg** (**10697 lb**)
Ground	**6197 kg** (**13662 lb**)	**6142 kg** (**13541 lb**)	**6168 kg** (**13598 lb**)
221F Z-Bar Specifications - **1.2 m³** (**1.6 yd³**) LM Bucket on HP Quick Coupler			
Full height	**3797 kg** (**8371 lb**)	**3738 kg** (**8241 lb**)	**3765 kg** (**8300 lb**)
Maximum reach	**4838 kg** (**10666 lb**)	**4779 kg** (**10536 lb**)	**4807 kg** (**10598 lb**)
Ground	**6108 kg** (**13466 lb**)	**6051 kg** (**13340 lb**)	**6078 kg** (**13400 lb**)
221F Z-Bar Specifications - **0.9 m³** (**1.2 yd³**) MP (4x1) Bucket on HP Quick Coupler			
Full height	**3495 kg** (**7705 lb**)	**3435 kg** (**7573 lb**)	**3467 kg** (**7643 lb**)
Maximum reach	**4534 kg** (**9996 lb**)	**4474 kg** (**9863 lb**)	**4504 kg** (**9930 lb**)
Ground	**5842 kg** (**12879 lb**)	**5783 kg** (**12749 lb**)	**5810 kg** (**12809 lb**)
221F Z-Bar Specifications - **0.9 m³** (**1.2 yd³**) GP Bucket on SSL Quick Coupler			
Full height	**3831 kg** (**8446 lb**)	**3772 kg** (**8316 lb**)	**3800 kg** (**8378 lb**)
Maximum reach	**4867 kg** (**10730 lb**)	**4809 kg** (**10602 lb**)	**4836 kg** (**10662 lb**)
Ground	**5948 kg** (**13113 lb**)	**5893 kg** (**12992 lb**)	**5918 kg** (**13047 lb**)
221F Z-Bar Specifications - **1.2 m³** (**1.6 yd³**) LM Bucket on SSL Quick Coupler			
Full height	**3782 kg** (**8338 lb**)	**3727 kg** (**8217 lb**)	**3756 kg** (**8281 lb**)
Maximum reach	**4818 kg** (**10622 lb**)	**4765 kg** (**10505 lb**)	**4792 kg** (**10565 lb**)
Ground	**5863 kg** (**12926 lb**)	**5813 kg** (**12815 lb**)	**5838 kg** (**12871 lb**)
221F Z-Bar Specifications - **0.9 m³** (**1.2 yd³**) MP (4x1) Bucket on SSL Quick Coupler			
Full height	**3507 kg** (**7732 lb**)	**3448 kg** (**7602 lb**)	**3476 kg** (**7663 lb**)
Maximum reach	**4539 kg** (**10007 lb**)	**4481 kg** (**9879 lb**)	**4508 kg** (**9938 lb**)
Ground	**5621 kg** (**12392 lb**)	**5565 kg** (**12269 lb**)	**5591 kg** (**12326 lb**)

321F Model configurations

The following table lists hydraulic lift capacities for lift applications of the 321F Z-Bar equipped with rear standard counterweight:

	Naked bucket	Bucket w/cutting edge	Bucket w/teeth
321F Z-Bar Specifications - **1.0 m³** (**1.3 yd³**) GP Bucket on HP Quick Coupler			
Full height	**3821 kg** (**8424 lb**)	**3763 kg** (**8296 lb**)	**3786 kg** (**8347 lb**)
Maximum reach	**4828 kg** (**10644 lb**)	**4767 kg** (**10509 lb**)	**4791 kg** (**10562 lb**)
Ground	**6235 kg** (**13746 lb**)	**6168 kg** (**13598 lb**)	**6194 kg** (**13655 lb**)
321F Z-Bar Specifications - **1.3 m³** (**1.7 yd³**) LM Bucket on HP Quick Coupler			
Full height	**3792 kg** (**8360 lb**)	**3732 kg** (**8228 lb**)	**3760 kg** (**8289 lb**)
Maximum reach	**4794 kg** (**10569 lb**)	**4734 kg** (**10437 lb**)	**4762 kg** (**10498 lb**)
Ground	**6144 kg** (**13545 lb**)	**6086 kg** (**13417 lb**)	**6113 kg** (**13477 lb**)
321F Z-Bar Specifications - **1.0 m³** (**1.3 yd³**) MP (4x1) Bucket on HP Quick Coupler			
Full height	**3484 kg** (**7681 lb**)	**3424 kg** (**7549 lb**)	**3452 kg** (**7610 lb**)
Maximum reach	**4487 kg** (**9892 lb**)	**4427 kg** (**9760 lb**)	**4455 kg** (**9822 lb**)
Ground	**5888 kg** (**12981 lb**)	**5829 kg** (**12851 lb**)	**5857 kg** (**12912 lb**)
321F Z-Bar Specifications - **1.0 m³** (**1.3 yd³**) GP Bucket on SSL Quick Coupler			
Full height	**3830 kg** (**8444 lb**)	**3771 kg** (**8314 lb**)	**3796 kg** (**8369 lb**)
Maximum reach	**4810 kg** (**10604 lb**)	**4750 kg** (**10472 lb**)	**4775 kg** (**10527 lb**)
Ground	**6013 kg** (**13256 lb**)	**5952 kg** (**13122 lb**)	**5981 kg** (**13186 lb**)
321F Z-Bar Specifications - **1.3 m³** (**1.7 yd³**) LM Bucket on SSL Quick Coupler			
Full height	**3786 kg** (**8347 lb**)	**3726 kg** (**8214 lb**)	**3754 kg** (**8276 lb**)
Maximum reach	**4766 kg** (**10507 lb**)	**4706 kg** (**10375 lb**)	**4734 kg** (**10437 lb**)
Ground	**5935 kg** (**13084 lb**)	**5878 kg** (**12959 lb**)	**5905 kg** (**13018 lb**)
321F Z-Bar Specifications - **1.0 m³** (**1.3 yd³**) MP (4x1) Bucket on SSL Quick Coupler			
Full height	**3497 kg** (**7710 lb**)	**3437 kg** (**7577 lb**)	**3465 kg** (**7639 lb**)
Maximum reach	**4476 kg** (**9868 lb**)	**4416 kg** (**9736 lb**)	**4444 kg** (**9797 lb**)
Ground	**5684 kg** (**12531 lb**)	**5626 kg** (**12403 lb**)	**5653 kg** (**12463 lb**)

Machine specifications and dimensions – 21F General specifications

The following specifications are common to 21F Z-bar and 21F XT model configurations, equipped with standard tire (12.5-18 tires).

21F common to all buckets specifications (Z-bar and XT)

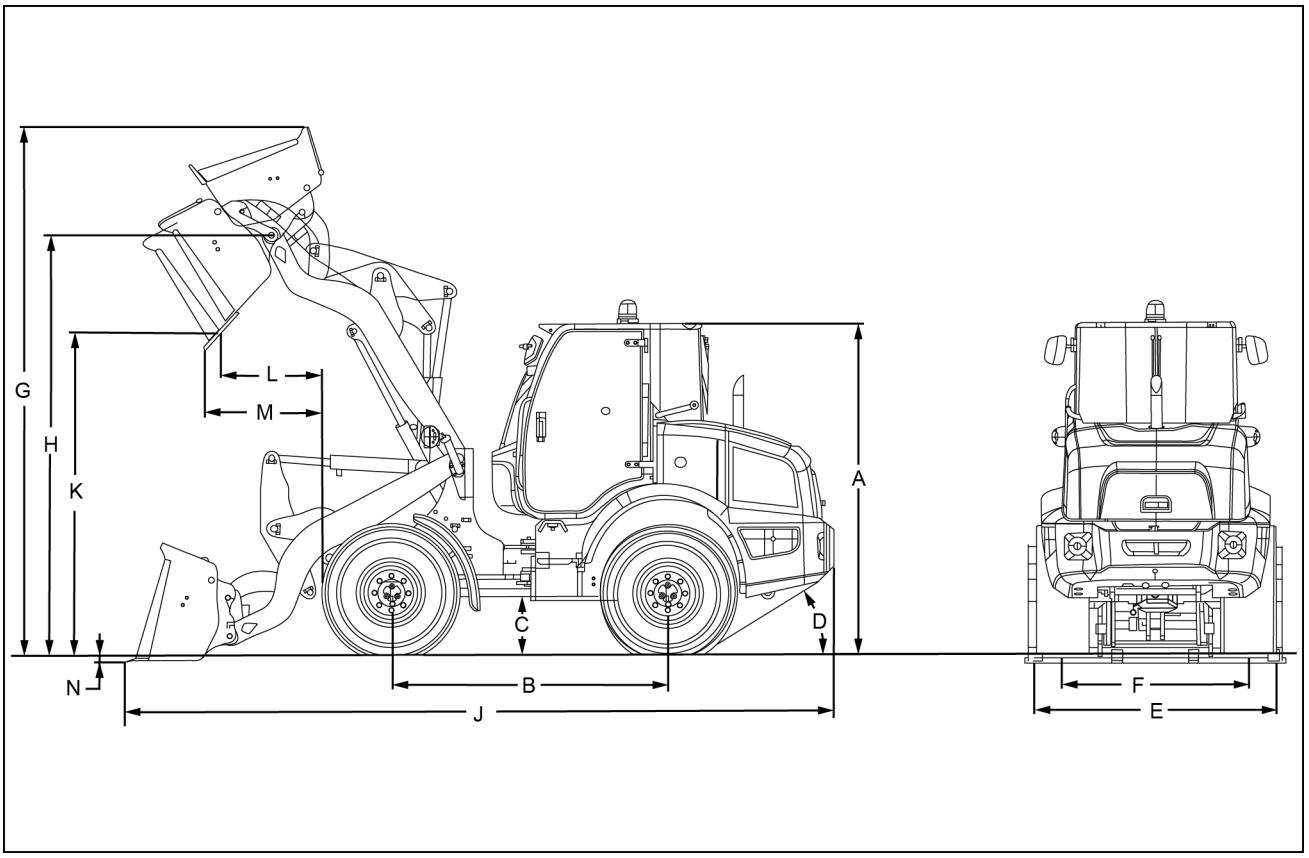
Feature	21F Z-bar	21F XT
Overall height (top of exhaust)	**2060 mm** (**81.1 in**)	**2060 mm** (**81.1 in**)
Turning radius (outside of tires)	**3721 mm** (**146.5 in**)	**3721 mm** (**146.5 in**)
Turning angle from center	**40°**	**40°**
Total turning angle	**80°**	**80°**
Rear axle oscillation total	**18°**	**18°**
Height to lower drawbar	**783 mm** (**30.8 in**)	**783 mm** (**30.8 in**)
Vertical wheel travel (trunnion fully oscillated)	**260 mm** (**10.2 in**)	**260 mm** (**10.2 in**)
Hinge pin height (carry position)	**440 mm** (**17.3 in**)	**398 mm** (**15.7 in**)
Implement cycle time	21F Z-bar	21F XT
Raising time – Loaded	**6.3 s**	**4.6 s**
Lowering time – Empty power down	**3.8 s**	**3.8 s**
Dump time – Loaded	**1.7 s**	**1.4 s**

Glossary

A table of the acronyms used in this section, is reported.

Bucket acronyms	
Acronym	Definition
GP	General Purpose
LM	Light Material
MP (4x1)	Multi Purpose (4x1)
Quick Coupler acronyms	
Acronym	Definition
HP	Horizontal Pin
SSL	Skid Steer Loader

21F Z–bar Loader – Lift Arm Specifications



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21F Z-bar Specifications - 0.7 m³ (0.92 yd³) GP Bucket on HP Quick Coupler (rear standard counterweight)

	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**0.5 m³** (**0.65 yd³**)	**0.5 m³** (**0.65 yd³**)	**0.5 m³** (**0.65 yd³**)
Heaped	**0.7 m³** (**0.92 yd³**)	**0.7 m³** (**0.92 yd³**)	**0.7 m³** (**0.92 yd³**)
Bucket width (maximum outer)	**1900 mm** (**74.8 in**)	**1900 mm** (**74.8 in**)	**1900 mm** (**74.8 in**)
Dimensional Outline Specifications			
A (top of cab height)	**2458 mm** (**96.8 in**)	**2458 mm** (**96.8 in**)	**2458 mm** (**96.8 in**)
B (wheelbase)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)
C (ground clearance to cardan shaft)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)
D (rear angle of departure)	**28°**	**28°**	**28°**
E (overall width w/o bucket)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)
F (tread width)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)
G (overall height spillguard)	**3941 mm** (**155.2 in**)	**3940 mm** (**155.1 in**)	**3941 mm** (**155.2 in**)
H (hinge pin - fully raised)	**3136 mm** (**123.5 in**)	**3136 mm** (**123.5 in**)	**3136 mm** (**123.5 in**)
J (overall - bucket level on ground)	**5283 mm** (**208.0 in**)	**5334 mm** (**210.0 in**)	**5404 mm** (**212.8 in**)
K (dump - fully raised, **45°** dump)	**2490 mm** (**98.0 in**)	**2454 mm** (**96.6 in**)	**2405 mm** (**94.7 in**)
L (reach - fully raised, **45°** dump)	**766 mm** (**30.2 in**)	**803 mm** (**31.6 in**)	**852 mm** (**33.5 in**)
M (reach - **2.13 m** (**7.0 ft**), **45°** dump)	**1102 mm** (**43.4 in**)	**1111 mm** (**43.7 in**)	**1120 mm** (**44.1 in**)
N (dig depth)	**73 mm** (**2.9 in**)	**73 mm** (**2.9 in**)	**73 mm** (**2.9 in**)
ISO Load Specifications			
Operating load	**1703 kg** (**3754 lb**)	**1674 kg** (**3691 lb**)	**1687 kg** (**3719 lb**)
Tipping load – machine straight	**4036 kg** (**8898 lb**)	**3977 kg** (**8768 lb**)	**4005 kg** (**8830 lb**)
Tipping load – 40° turn	**3406 kg** (**7509 lb**)	**3347 kg** (**7379 lb**)	**3374 kg** (**7438 lb**)

21F Z-bar Specifications - 1.0 m³ (1.31 yd³) LM Bucket on HP Quick Coupler (rear standard counterweight)

	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**0.8 m³ (1.05 yd³)**	**0.8 m³ (1.05 yd³)**	**0.8 m³ (1.05 yd³)**
Heaped	**1.0 m³ (1.31 yd³)**	**1.0 m³ (1.31 yd³)**	**1.0 m³ (1.31 yd³)**
Bucket width (maximum outer)	**2050 mm (80.7 in)**	**2050 mm (80.7 in)**	**2050 mm (80.7 in)**
Dimensional Outline Specifications			
A (top of cab height)	**2458 mm (96.8 in)**	**2458 mm (96.8 in)**	**2458 mm (96.8 in)**
B (wheelbase)	**2075 mm (81.7 in)**	**2075 mm (81.7 in)**	**2075 mm (81.7 in)**
C (ground clearance to cardan shaft)	**444 mm (17.5 in)**	**444 mm (17.5 in)**	**444 mm (17.5 in)**
D (rear angle of departure)	**28°**	**28°**	**28°**
E (overall width w/o bucket)	**1740 mm (68.5 in)**	**1740 mm (68.5 in)**	**1740 mm (68.5 in)**
F (tread width)	**1400 mm (55.1 in)**	**1400 mm (55.1 in)**	**1400 mm (55.1 in)**
G (overall height spillguard)	**4049 mm (159.4 in)**	**4049 mm (159.4 in)**	**4049 mm (159.4 in)**
H (hinge pin - fully raised)	**3136 mm (123.5 in)**	**3136 mm (123.5 in)**	**3136 mm (123.5 in)**
J (overall - bucket level on ground)	**5408 mm (212.9 in)**	**5459 mm (214.9 in)**	**5529 mm (217.7 in)**
K (dump - fully raised, **45°** dump)	**2402 mm (94.6 in)**	**2365 mm (93.1 in)**	**2316 mm (91.2 in)**
L (reach - fully raised, **45°** dump)	**855 mm (33.7 in)**	**891 mm (35.1 in)**	**940 mm (37.0 in)**
M (reach - **2.13 m (7.0 ft)**, **45°** dump)	**1121 mm (44.1 in)**	**1126 mm (44.3 in)**	**1131 mm (44.5 in)**
N (dig depth)	**73 mm (2.9 in)**	**73 mm (2.9 in)**	**73 mm (2.9 in)**
ISO Load Specifications			
Operating load	**1702 kg (3752 lb)**	**1676 kg (3695 lb)**	**1687 kg (3719 lb)**
Tipping load – machine straight	**3952 kg (8713 lb)**	**3897 kg (8591 lb)**	**3918 kg (8638 lb)**
Tipping load – 40° turn	**3404 kg (7505 lb)**	**3353 kg (7392 lb)**	**3374 kg (7438 lb)**

21F Z-bar Specifications - 0.7 m³ (0.92 yd³) MP (4x1) Bucket on HP Quick Coupler (rear standard counterweight)

	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**0.5 m³ (0.65 yd³)**	**0.5 m³ (0.65 yd³)**	**0.5 m³ (0.65 yd³)**
Heaped	**0.7 m³ (0.92 yd³)**	**0.7 m³ (0.92 yd³)**	**0.7 m³ (0.92 yd³)**
Bucket width (maximum outer)	**1900 mm (74.8 in)**	**1900 mm (74.8 in)**	**1900 mm (74.8 in)**
Dimensional Outline Specifications			
A (top of cab height)	**2458 mm (96.8 in)**	**2458 mm (96.8 in)**	**2458 mm (96.8 in)**
B (wheelbase)	**2075 mm (81.7 in)**	**2075 mm (81.7 in)**	**2075 mm (81.7 in)**
C (ground clearance to cardan shaft)	**444 mm (17.5 in)**	**444 mm (17.5 in)**	**444 mm (17.5 in)**
D (rear angle of departure)	**28°**	**28°**	**28°**
E (overall width w/o bucket)	**1740 mm (68.5 in)**	**1740 mm (68.5 in)**	**1740 mm (68.5 in)**
F (tread width)	**1400 mm (55.1 in)**	**1400 mm (55.1 in)**	**1400 mm (55.1 in)**
G (overall height spillguard)	**4113 mm (161.9 in)**	**4113 mm (161.9 in)**	**4113 mm (161.9 in)**
H (hinge pin - fully raised)	**3136 mm (123.5 in)**	**3136 mm (123.5 in)**	**3136 mm (123.5 in)**
J (overall - bucket level on ground)	**5370 mm (211.4 in)**	**5421 mm (213.4 in)**	**5491 mm (216.2 in)**
K (dump - fully raised, **45°** dump)	**2428 mm (95.6 in)**	**2392 mm (94.2 in)**	**2343 mm (92.2 in)**
L (reach - fully raised, **45°** dump)	**827 mm (32.6 in)**	**863 mm (34.0 in)**	**913 mm (35.9 in)**
M (reach - **2.13 m (7.0 ft)**, **45°** dump)	**1115 mm (43.9 in)**	**1121 mm (44.1 in)**	**1128 mm (44.4 in)**
N (dig depth)	**73 mm (2.9 in)**	**73 mm (2.9 in)**	**73 mm (2.9 in)**
ISO Load Specifications			
Operating load	**1595 kg (3516 lb)**	**1471 kg (3243 lb)**	**1580 kg (3483 lb)**
Tipping load – machine straight	**3720 kg (8201 lb)**	**3489 kg (7692 lb)**	**3680 kg (8113 lb)**
Tipping load – 40° turn	**3190 kg (7033 lb)**	**2941 kg (6484 lb)**	**3160 kg (6967 lb)**

21F Z-bar Specifications - 0.7 m³ (0.92 yd³) GP Bucket on SSL Quick Coupler (rear standard counterweight)

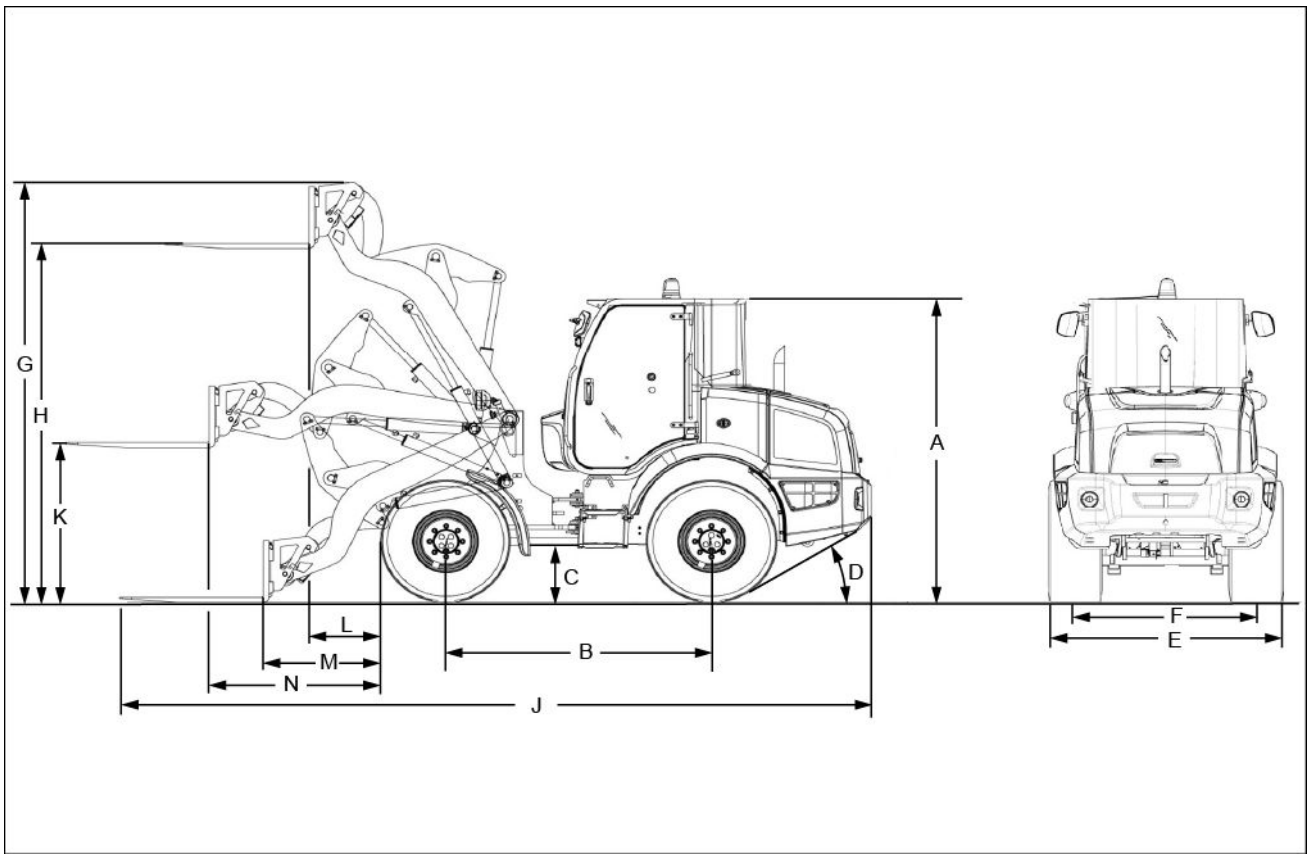
	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**0.5 m³** (**0.65 yd³**)	**0.5 m³** (**0.65 yd³**)	**0.5 m³** (**0.65 yd³**)
Heaped	**0.7 m³** (**0.92 yd³**)	**0.7 m³** (**0.92 yd³**)	**0.7 m³** (**0.92 yd³**)
Bucket width (maximum outer)	**1900 mm** (**74.8 in**)	**1900 mm** (**74.8 in**)	**1900 mm** (**74.8 in**)
Dimensional Outline Specifications			
A (top of cab height)	**2458 mm** (**96.8 in**)	**2458 mm** (**96.8 in**)	**2458 mm** (**96.8 in**)
B (wheelbase)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)
C (ground clearance to cardan shaft)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)
D (rear angle of departure)	**28°**	**28°**	**28°**
E (overall width w/o bucket)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)
F (tread width)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)
G (overall height spillguard)	**4072 mm** (**160.3 in**)	**4072 mm** (**160.3 in**)	**4072 mm** (**160.3 in**)
H (hinge pin - fully raised)	**3136 mm** (**123.5 in**)	**3136 mm** (**123.5 in**)	**3136 mm** (**123.5 in**)
J (overall - bucket level on ground)	**5428 mm** (**213.7 in**)	**5480 mm** (**215.7 in**)	**5549 mm** (**218.5 in**)
K (dump - fully raised, **45°** dump)	**2388 mm** (**94.0 in**)	**2351 mm** (**92.6 in**)	**2302 mm** (**90.6 in**)
L (reach - fully raised, **45°** dump)	**871 mm** (**34.3 in**)	**908 mm** (**35.7 in**)	**957 mm** (**37.7 in**)
M (reach - **2.13 m** (**7.0 ft**), **45°** dump)	**1125 mm** (**44.3 in**)	**1130 mm** (**44.5 in**)	**1135 mm** (**44.7 in**)
N (dig depth)	**71 mm** (**2.8 in**)	**71 mm** (**2.8 in**)	**71 mm** (**2.8 in**)
ISO Load Specifications			
Operating load	**1587 kg** (**3499 lb**)	**1559 kg** (**3437 lb**)	**1587 kg** (**3499 lb**)
Tipping load – machine straight	**3794 kg** (**8364 lb**)	**3737 kg** (**8239 lb**)	**3761 kg** (**8292 lb**)
Tipping load – 40° turn	**3175 kg** (**7000 lb**)	**3118 kg** (**6874 lb**)	**3174 kg** (**6997 lb**)

21F Z-bar Specifications - 1.0 m³ (1.31 yd³) LM Bucket on SSL Quick Coupler (rear standard counterweight)

	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**0.8 m³** (**1.05 yd³**)	**0.8 m³** (**1.05 yd³**)	**0.8 m³** (**1.05 yd³**)
Heaped	**1.0 m³** (**1.31 yd³**)	**1.0 m³** (**1.31 yd³**)	**1.0 m³** (**1.31 yd³**)
Bucket width (maximum outer)	**2050 mm** (**80.7 in**)	**2050 mm** (**80.7 in**)	**2050 mm** (**80.7 in**)
Dimensional Outline Specifications			
A (top of cab height)	**2458 mm** (**96.8 in**)	**2458 mm** (**96.8 in**)	**2458 mm** (**96.8 in**)
B (wheelbase)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)
C (ground clearance to cardan shaft)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)
D (rear angle of departure)	**28°**	**28°**	**28°**
E (overall width w/o bucket)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)
F (tread width)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)
G (overall height spillguard)	**4211 mm** (**165.8 in**)	**4210 mm** (**165.7 in**)	**4211 mm** (**165.8 in**)
H (hinge pin - fully raised)	**3136 mm** (**123.5 in**)	**3136 mm** (**123.5 in**)	**3136 mm** (**123.5 in**)
J (overall - bucket level on ground)	**5515 mm** (**217.1 in**)	**5567 mm** (**219.2 in**)	**5636 mm** (**221.9 in**)
K (dump - fully raised, **45°** dump)	**2326 mm** (**91.6 in**)	**2289 mm** (**90.1 in**)	**2240 mm** (**88.2 in**)
L (reach - fully raised, **45°** dump)	**933 mm** (**36.7 in**)	**969 mm** (**38.1 in**)	**1018 mm** (**40.1 in**)
M (reach - **2.13 m** (**7.0 ft**), **45°** dump)	**1133 mm** (**44.6 in**)	**1135 mm** (**44.7 in**)	**1136 mm** (**44.7 in**)
N (dig depth)	**71 mm** (**2.8 in**)	**71 mm** (**2.8 in**)	**71 mm** (**2.8 in**)
ISO Load Specifications			
Operating load	**1626 kg** (**3585 lb**)	**1603 kg** (**3534 lb**)	**1579 kg** (**3481 lb**)
Tipping load – machine straight	**3772 kg** (**8316 lb**)	**3717 kg** (**8195 lb**)	**3788 kg** (**8351 lb**)
Tipping load – 40° turn	**3251 kg** (**7167 lb**)	**3205 kg** (**7066 lb**)	**3107 kg** (**6850 lb**)

21F Z-bar Specifications - 0.7 m³ (0.92 yd³) MP (4x1) Bucket on SSL Quick Coupler (rear standard counterweight)

	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**0.5 m³** (**0.65 yd³**)	**0.5 m³** (**0.65 yd³**)	**0.5 m³** (**0.65 yd³**)
Heaped	**0.7 m³** (**0.92 yd³**)	**0.7 m³** (**0.92 yd³**)	**0.7 m³** (**0.92 yd³**)
Bucket width (maximum outer)	**1900 mm** (**74.8 in**)	**1900 mm** (**74.8 in**)	**1900 mm** (**74.8 in**)
Dimensional Outline Specifications			
A (top of cab height)	**2458 mm** (**96.8 in**)	**2458 mm** (**96.8 in**)	**2458 mm** (**96.8 in**)
B (wheelbase)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)
C (ground clearance to cardan shaft)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)
D (rear angle of departure)	**28°**	**28°**	**28°**
E (overall width w/o bucket)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)
F (tread width)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)
G (overall height spillguard)	**4164 mm** (**163.9 in**)	**4164 mm** (**163.9 in**)	**4164 mm** (**163.9 in**)
H (hinge pin - fully raised)	**3136 mm** (**123.5 in**)	**3136 mm** (**123.5 in**)	**3136 mm** (**123.5 in**)
J (overall - bucket level on ground)	**5442 mm** (**214.3 in**)	**5494 mm** (**216.3 in**)	**5563 mm** (**219.0 in**)
K (dump - fully raised, **45°** dump)	**2377 mm** (**93.6 in**)	**2340 mm** (**92.1 in**)	**2291 mm** (**90.2 in**)
L (reach - fully raised, **45°** dump)	**880 mm** (**34.6 in**)	**917 mm** (**36.1 in**)	**966 mm** (**38.0 in**)
M (reach - **2.13 m** (**7.0 ft**), **45°** dump)	**1126 mm** (**44.3 in**)	**1130 mm** (**44.5 in**)	**1134 mm** (**44.6 in**)
N (dig depth)	**71 mm** (**2.8 in**)	**71 mm** (**2.8 in**)	**71 mm** (**2.8 in**)
ISO Load Specifications			
Operating load	**1508 kg** (**3325 lb**)	**1487 kg** (**3278 lb**)	**1494 kg** (**3294 lb**)
Tipping load – machine straight	**3510 kg** (**7738 lb**)	**3466 kg** (**7641 lb**)	**3473 kg** (**7657 lb**)
Tipping load – 40° turn	**3016 kg** (**6649 lb**)	**2975 kg** (**6559 lb**)	**2988 kg** (**6587 lb**)



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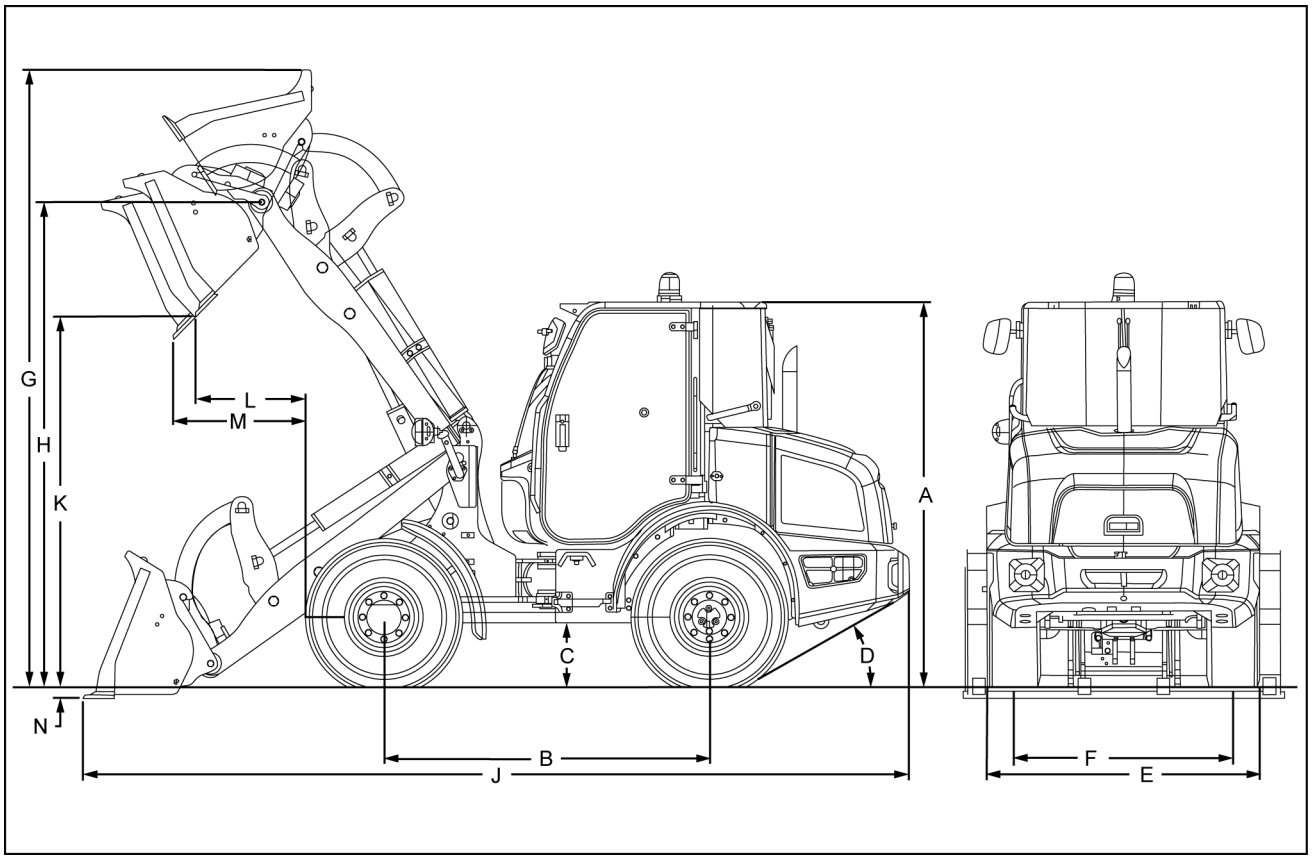
21F Z-bar Specifications - Standard forks (rear standard counterweight)

	HP Quick Coupler	SSL Quick Coupler
Forks Specifications		
Fork length	**1200 mm** (**47.2 in**)	**1200 mm** (**47.2 in**)
Fork maximum width (outside to outside of tine)	**956 mm** (**37.6 in**)	**956 mm** (**37.6 in**)
Dimensional Outline Specifications		
A (top of cab height)	**2458 mm** (**96.8 in**)	**2458 mm** (**96.8 in**)
B (wheelbase)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)
C (ground clearance to cardan shaft)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)
D (rear angle of departure)	**28°**	**28°**
E (overall width w/o bucket)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)
F (tread width)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)
G (overall height – operating top of attachment)	**3483 mm** (**137.1 in**)	**3641 mm** (**143.3 in**)
H (ground clearance to top of tine – fully raised)	**2903 mm** (**114.3 in**)	**2982 mm** (**117.4 in**)
J (overall - forks level on ground)	**5985 mm** (**235.6 in**)	**6155 mm** (**242.3 in**)
K (reach – ground clearance to top of tine)	**1266 mm** (**49.8 in**)	**1345 mm** (**53.0 in**)
L (reach - fully raised, vertical front surface of tine)	**592 mm** (**23.3 in**)	**762 mm** (**30.0 in**)
M (reach – ground to vertical front surface of tine)	**937 mm** (**36.9 in**)	**1046 mm** (**41.2 in**)
N (maximum reach – vertical front surface of tine)	**1352 mm** (**53.2 in**)	**1522 mm** (**59.9 in**)
Load Specifications (EN 474–3)		
Operating load		
Rough terrain	**1436 kg** (**3166 lb**)	**1328 kg** (**2928 lb**)
Firm and level ground	**1915 kg** (**4222 lb**)	**1770 kg** (**3902 lb**)
ISO Load Specifications		
Tipping load		
Machine straight	**2790 kg** (**6151 lb**)	**2563 kg** (**5650 lb**)
40° turn	**2394 kg** (**5278 lb**)	**2213 kg** (**4879 lb**)

21F XT Loader – Lift Arm Specifications



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21F XT Specifications - 0.7 m³ (0.92 yd³) GP Bucket on HP Quick Coupler (rear standard counterweight)

	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**0.5 m³** (**0.65 yd³**)	**0.5 m³** (**0.65 yd³**)	**0.5 m³** (**0.65 yd³**)
Heaped	**0.7 m³** (**0.92 yd³**)	**0.7 m³** (**0.92 yd³**)	**0.7 m³** (**0.92 yd³**)
Bucket width (maximum outer)	**1900 mm** (**74.8 in**)	**1900 mm** (**74.8 in**)	**1900 mm** (**74.8 in**)
Dimensional Outline Specifications			
A (top of cab height)	**2458 mm** (**96.8 in**)	**2458 mm** (**96.8 in**)	**2458 mm** (**96.8 in**)
B (wheelbase)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)
C (ground clearance to cardan shaft)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)
D (rear angle of departure)	**28°**	**28°**	**28°**
E (overall width w/o bucket)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)
F (tread width)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)
G (overall height spillguard)	**3945 mm** (**155.3 in**)	**3945 mm** (**155.3 in**)	**3945 mm** (**155.3 in**)
H (hinge pin - fully raised)	**3113 mm** (**122.6 in**)	**3113 mm** (**122.6 in**)	**3113 mm** (**122.6 in**)
J (overall - bucket level on ground)	**5168 mm** (**203.5 in**)	**5219 mm** (**205.5 in**)	**5289 mm** (**208.2 in**)
K (dump - fully raised, **45°** dump)	**2446 mm** (**96.3 in**)	**2396 mm** (**94.3 in**)	**2341 mm** (**92.2 in**)
L (reach - fully raised, **45°** dump)	**645 mm** (**25.4 in**)	**668 mm** (**26.3 in**)	**711 mm** (**28.0 in**)
M (reach - **2.13 m** (**7.0 ft**), **45°** dump)	**969 mm** (**38.1 in**)	**948 mm** (**37.3 in**)	**941 mm** (**37.0 in**)
N (dig depth)	**126 mm** (**5.0 in**)	**126 mm** (**5.0 in**)	**126 mm** (**5.0 in**)
ISO Load Specifications			
Operating load	**1632 kg** (**3597 lb**)	**1600 kg** (**3527 lb**)	**1613 kg** (**3555 lb**)
Tipping load – machine straight	**3775 kg** (**8322 lb**)	**3703 kg** (**8164 lb**)	**3733 kg** (**8230 lb**)
Tipping load – 40° turn	**3263 kg** (**7194 lb**)	**3200 kg** (**7055 lb**)	**3225 kg** (**7110 lb**)

21F XT Specifications - 0.8 m³ (1.05 yd³) LM Bucket on HP Quick Coupler (rear standard counterweight)

	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**0.6 m³** (**0.78 yd³**)	**0.6 m³** (**0.78 yd³**)	**0.6 m³** (**0.78 yd³**)
Heaped	**0.8 m³** (**1.05 yd³**)	**0.8 m³** (**1.05 yd³**)	**0.8 m³** (**1.05 yd³**)
Bucket width (maximum outer)	**2050 mm** (**80.7 in**)	**2050 mm** (**80.7 in**)	**2050 mm** (**80.7 in**)
Dimensional Outline Specifications			
A (top of cab height)	**2458 mm** (**96.8 in**)	**2458 mm** (**96.8 in**)	**2458 mm** (**96.8 in**)
B (wheelbase)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)
C (ground clearance to cardan shaft)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)
D (rear angle of departure)	**28°**	**28°**	**28°**
E (overall width w/o bucket)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)
F (tread width)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)
G (overall height spillguard)	**3961 mm** (**155.9 in**)	**3961 mm** (**155.9 in**)	**3961 mm** (**155.9 in**)
H (hinge pin - fully raised)	**3113 mm** (**122.6 in**)	**3113 mm** (**122.6 in**)	**3113 mm** (**122.6 in**)
J (overall - bucket level on ground)	**5193 mm** (**204.4 in**)	**5245 mm** (**206.5 in**)	**5314 mm** (**209.2 in**)
K (dump - fully raised, **45°** dump)	**2428 mm** (**95.6 in**)	**2378 mm** (**93.6 in**)	**2324 mm** (**91.5 in**)
L (reach - fully raised, **45°** dump)	**664 mm** (**26.1 in**)	**687 mm** (**27.0 in**)	**731 mm** (**28.8 in**)
M (reach - **2.13 m** (**7.0 ft**), **45°** dump)	**972 mm** (**38.3 in**)	**951 mm** (**37.4 in**)	**944 mm** (**37.2 in**)
N (dig depth)	**126 mm** (**5.0 in**)	**126 mm** (**5.0 in**)	**126 mm** (**5.0 in**)
ISO Load Specifications			
Operating load	**1616 kg** (**3563 lb**)	**1584 kg** (**3492 lb**)	**1597 kg** (**3521 lb**)
Tipping load – machine straight	**3740 kg** (**8245 lb**)	**3668 kg** (**8087 lb**)	**3698 kg** (**8153 lb**)
Tipping load – 40° turn	**3231 kg** (**7123 lb**)	**3168 kg** (**6984 lb**)	**3194 kg** (**7042 lb**)

21F XT Specifications - 0.7 m³ (0.92 yd³) MP (4x1) Bucket on HP Quick Coupler (rear standard counterweight)

	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**0.5 m³** (**0.65 yd³**)	**0.5 m³** (**0.65 yd³**)	**0.5 m³** (**0.65 yd³**)
Heaped	**0.7 m³** (**0.92 yd³**)	**0.7 m³** (**0.92 yd³**)	**0.7 m³** (**0.92 yd³**)
Bucket width (maximum outer)	**1900 mm** (**74.8 in**)	**1900 mm** (**74.8 in**)	**1900 mm** (**74.8 in**)
Dimensional Outline Specifications			
A (top of cab height)	**2458 mm** (**96.8 in**)	**2458 mm** (**96.8 in**)	**2458 mm** (**96.8 in**)
B (wheelbase)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)
C (ground clearance to cardan shaft)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)
D (rear angle of departure)	**28°**	**28°**	**28°**
E (overall width w/o bucket)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)
F (tread width)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)
G (overall height spillguard)	**4076 mm** (**160.5 in**)	**4076 mm** (**160.5 in**)	**4076 mm** (**160.5 in**)
H (hinge pin - fully raised)	**3113 mm** (**122.6 in**)	**3113 mm** (**122.6 in**)	**3113 mm** (**122.6 in**)
J (overall - bucket level on ground)	**5179 mm** (**203.9 in**)	**5231 mm** (**205.9 in**)	**5300 mm** (**208.7 in**)
K (dump - fully raised, **45°** dump)	**2438 mm** (**96.0 in**)	**2388 mm** (**94.0 in**)	**2334 mm** (**91.9 in**)
L (reach - fully raised, **45°** dump)	**654 mm** (**25.7 in**)	**678 mm** (**26.7 in**)	**721 mm** (**28.4 in**)
M (reach - **2.13 m** (**7.0 ft**), **45°** dump)	**971 mm** (**38.2 in**)	**950 mm** (**37.4 in**)	**944 mm** (**37.2 in**)
N (dig depth)	**126 mm** (**5.0 in**)	**126 mm** (**5.0 in**)	**126 mm** (**5.0 in**)
ISO Load Specifications			
Operating load	**1458 kg** (**3213 lb**)	**1426 kg** (**3143 lb**)	**1439 kg** (**3171 lb**)
Tipping load – machine straight	**3385 kg** (**7463 lb**)	**3314 kg** (**7306 lb**)	**3343 kg** (**7370 lb**)
Tipping load – 40° turn	**2915 kg** (**6426 lb**)	**2851 kg** (**6285 lb**)	**2877 kg** (**6343 lb**)

21F XT Specifications - 0.7 m³ (0.92 yd³) GP Bucket on SSL Quick Coupler (rear standard counterweight)

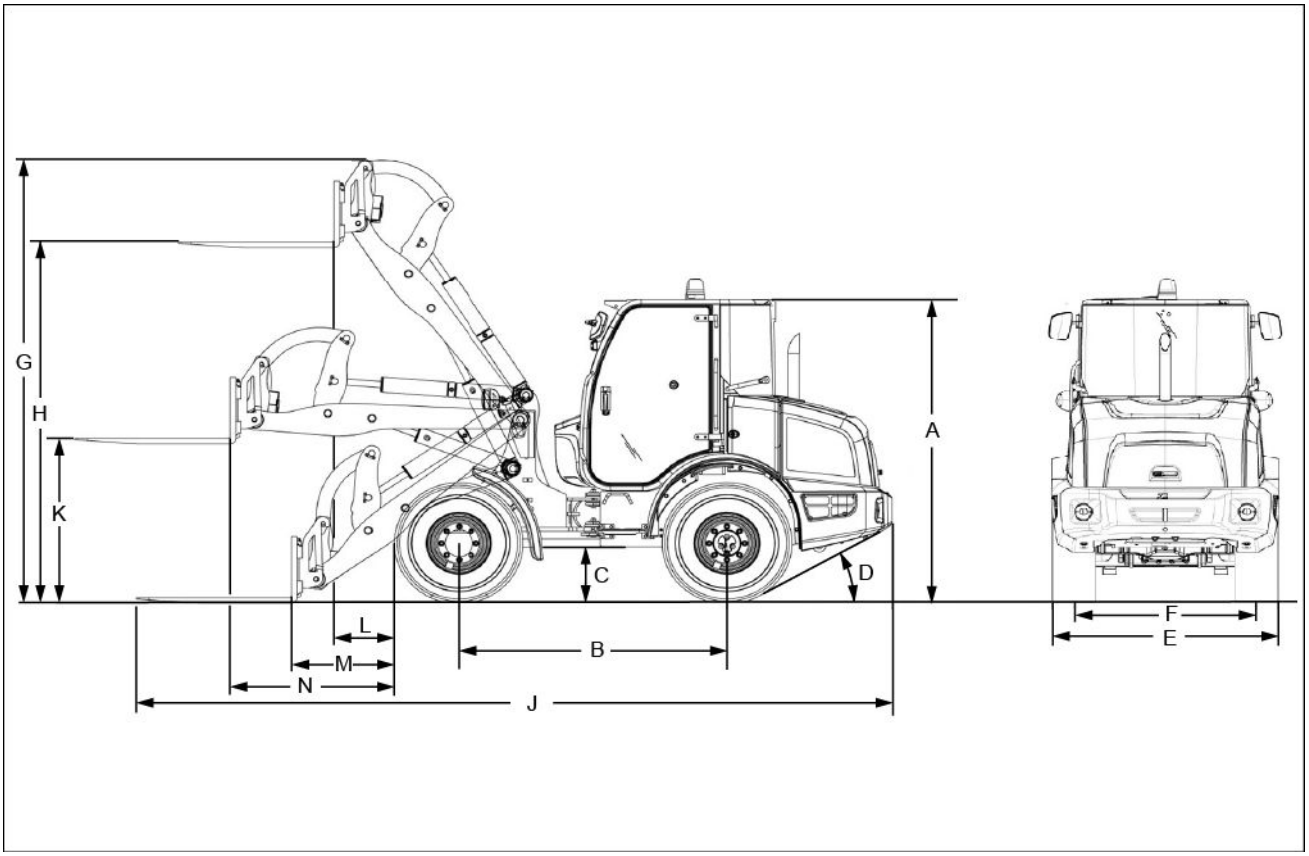
	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**0.5 m³** (**0.65 yd³**)	**0.5 m³** (**0.65 yd³**)	**0.5 m³** (**0.65 yd³**)
Heaped	**0.7 m³** (**0.92 yd³**)	**0.7 m³** (**0.92 yd³**)	**0.7 m³** (**0.92 yd³**)
Bucket width (maximum outer)	**1900 mm** (**74.8 in**)	**1900 mm** (**74.8 in**)	**1900 mm** (**74.8 in**)
Dimensional Outline Specifications			
A (top of cab height)	**2458 mm** (**96.8 in**)	**2458 mm** (**96.8 in**)	**2458 mm** (**96.8 in**)
B (wheelbase)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)
C (ground clearance to cardan shaft)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)
D (rear angle of departure)	**28°**	**28°**	**28°**
E (overall width w/o bucket)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)
F (tread width)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)
G (overall height spillguard)	**4046 mm** (**159.3 in**)	**4046 mm** (**159.3 in**)	**4046 mm** (**159.3 in**)
H (hinge pin - fully raised)	**3113 mm** (**122.6 in**)	**3113 mm** (**122.6 in**)	**3113 mm** (**122.6 in**)
J (overall - bucket level on ground)	**5262 mm** (**207.2 in**)	**5313 mm** (**209.2 in**)	**5382 mm** (**211.9 in**)
K (dump - fully raised, **45°** dump)	**2390 mm** (**94.1 in**)	**2340 mm** (**92.1 in**)	**2287 mm** (**90.0 in**)
L (reach - fully raised, **45°** dump)	**729 mm** (**28.7 in**)	**752 mm** (**29.6 in**)	**798 mm** (**31.4 in**)
M (reach - **2.13 m** (**7.0 ft**), **45°** dump)	**1003 mm** (**39.5 in**)	**981 mm** (**38.6 in**)	**974 mm** (**38.6 in**)
N (dig depth)	**127 mm** (**5.0 in**)	**127 mm** (**5.0 in**)	**127 mm** (**5.0 in**)
ISO Load Specifications			
Operating load	**1619 kg** (**3568 lb**)	**1587 kg** (**3499 lb**)	**1600 kg** (**3527 lb**)
Tipping load – machine straight	**3745 kg** (**8256 lb**)	**3674 kg** (**8100 lb**)	**3703 kg** (**8164 lb**)
Tipping load – 40° turn	**3237 kg** (**7136 lb**)	**3174 kg** (**6997 lb**)	**3200 kg** (**7055 lb**)

21F XT Specifications - 0.8 m³ (1.05 yd³) LM Bucket on SSL Quick Coupler (rear standard counterweight)

	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**0.6 m³** (**0.78 yd³**)	**0.6 m³** (**0.78 yd³**)	**0.6 m³** (**0.78 yd³**)
Heaped	**0.8 m³** (**1.05 yd³**)	**0.8 m³** (**1.05 yd³**)	**0.8 m³** (**1.05 yd³**)
Bucket width (maximum outer)	**2050 mm** (**80.7 in**)	**2050 mm** (**80.7 in**)	**2050 mm** (**80.7 in**)
Dimensional Outline Specifications			
A (top of cab height)	**2458 mm** (**96.8 in**)	**2458 mm** (**96.8 in**)	**2458 mm** (**96.8 in**)
B (wheelbase)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)
C (ground clearance to cardan shaft)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)
D (rear angle of departure)	**28°**	**28°**	**28°**
E (overall width w/o bucket)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)
F (tread width)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)
G (overall height spillguard)	**4041 mm** (**159.1 in**)	**4041 mm** (**159.1 in**)	**4041 mm** (**159.1 in**)
H (hinge pin - fully raised)	**3113 mm** (**122.6 in**)	**3113 mm** (**122.6 in**)	**3113 mm** (**122.6 in**)
J (overall - bucket level on ground)	**5273 mm** (**207.6 in**)	**5324 mm** (**209.6 in**)	**5393 mm** (**212.3 in**)
K (dump - fully raised, **45°** dump)	**2379 mm** (**93.7 in**)	**2329 mm** (**91.7 in**)	**2276 mm** (**89.6 in**)
L (reach - fully raised, **45°** dump)	**740 mm** (**29.1 in**)	**760 mm** (**29.9 in**)	**809 mm** (**31.9 in**)
M (reach - **2.13 m** (**7.0 ft**), **45°** dump)	**1005 mm** (**39.6 in**)	**982 mm** (**38.7 in**)	**974 mm** (**38.3 in**)
N (dig depth)	**127 mm** (**5.0 in**)	**127 mm** (**5.0 in**)	**127 mm** (**5.0 in**)
ISO Load Specifications			
Operating load	**1585 kg** (**3494 lb**)	**1555 kg** (**3428 lb**)	**1566 kg** (**3452 lb**)
Tipping load – machine straight	**3670 kg** (**8091 lb**)	**3600 kg** (**7937 lb**)	**3626 kg** (**7994 lb**)
Tipping load – 40° turn	**3170 kg** (**6989 lb**)	**3110 kg** (**6856 lb**)	**3132 kg** (**6905 lb**)

21F XT Specifications - 0.7 m³ (0.92 yd³) MP (4x1) Bucket on SSL Quick Coupler (rear standard counterweight)

	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**0.5 m³** (**0.65 yd³**)	**0.5 m³** (**0.65 yd³**)	**0.5 m³** (**0.65 yd³**)
Heaped	**0.7 m³** (**0.92 yd³**)	**0.7 m³** (**0.92 yd³**)	**0.7 m³** (**0.92 yd³**)
Bucket width (maximum outer)	**1900 mm** (**74.8 in**)	**1900 mm** (**74.8 in**)	**1900 mm** (**74.8 in**)
Dimensional Outline Specifications			
A (top of cab height)	**2458 mm** (**96.8 in**)	**2458 mm** (**96.8 in**)	**2458 mm** (**96.8 in**)
B (wheelbase)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)
C (ground clearance to cardan shaft)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)
D (rear angle of departure)	**28°**	**28°**	**28°**
E (overall width w/o bucket)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)
F (tread width)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)
G (overall height spillguard)	**4149 mm** (**163.3 in**)	**4149 mm** (**163.3 in**)	**4149 mm** (**163.3 in**)
H (hinge pin - fully raised)	**3113 mm** (**122.6 in**)	**3113 mm** (**122.6 in**)	**3113 mm** (**122.6 in**)
J (overall - bucket level on ground)	**5267 mm** (**207.4 in**)	**5318 mm** (**209.4 in**)	**5387 mm** (**212.1 in**)
K (dump - fully raised, **45°** dump)	**2381 mm** (**93.07 in**)	**2332 mm** (**91.8 in**)	**2278 mm** (**89.7 in**)
L (reach - fully raised, **45°** dump)	**735 mm** (**28.9 in**)	**759 mm** (**29.9 in**)	**804 mm** (**31.7 in**)
M (reach - **2.13 m** (**7.0 ft**), **45°** dump)	**1002 mm** (**39.4 in**)	**980 mm** (**38.6 in**)	**971 mm** (**38.2 in**)
N (dig depth)	**127 mm** (**5.0 in**)	**127 mm** (**5.0 in**)	**127 mm** (**5.0 in**)
ISO Load Specifications			
Operating load	**1418 kg** (**3126 lb**)	**1387 kg** (**3058 lb**)	**1400 kg** (**3086 lb**)
Tipping load – machine straight	**3295 kg** (**7264 lb**)	**3225 kg** (**7110 lb**)	**3253 kg** (**7172 lb**)
Tipping load – 40° turn	**2836 kg** (**6252 lb**)	**2774 kg** (**6116 lb**)	**2800 kg** (**6173 lb**)



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21F XT Specifications - Standard forks (rear standard counterweight)

	HP Quick Coupler	SSL Quick Coupler
Forks Specifications		
Fork length	**1200 mm** (**47.2 in**)	**1200 mm** (**47.2 in**)
Fork maximum width (outside to outside of tine)	**956 mm** (**37.6 in**)	**956 mm** (**37.6 in**)
Dimensional Outline Specifications		
A (top of cab height)	**2458 mm** (**96.8 in**)	**2458 mm** (**96.8 in**)
B (wheelbase)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)
C (ground clearance to cardan shaft)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)
D (rear angle of departure)	**28°**	**28°**
E (overall width w/o bucket)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)
F (tread width)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)
G (overall height – operating top of attachment)	**3633 mm** (**143.0 in**)	**3617 mm** (**142.4 in**)
H (ground clearance to top of tine – fully raised)	**2959 mm** (**116.5 in**)	**2957 mm** (**116.4 in**)
J (overall - forks level on ground)	**5168 mm** (**203.5 in**)	**5318 mm** (**209.4 in**)
K (reach – ground clearance to top of tine)	**1344 mm** (**52.9 in**)	**1342 mm** (**52.8 in**)
L (reach - fully raised, vertical front surface of tine)	**457 mm** (**18.0 in**)	**607 mm** (**23.9 in**)
M (reach – ground to vertical front surface of tine)	**769 mm** (**30.3 in**)	**918 mm** (**36.1 in**)
N (maximum reach – vertical front surface of tine)	**1259 mm** (**49.6 in**)	**1400 mm** (**55.1 in**)
Load Specifications (EN 474–3)		
Operating load		
Rough terrain	**1539 kg** (**3393 lb**)	**1424 kg** (**3139 lb**)
Firm and level ground	**2052 kg** (**4524 lb**)	**1899 kg** (**4187 lb**)
ISO Load Specifications		
Tipping load		
Machine straight	**2966 kg** (**6539 lb**)	**2747 kg** (**6056 lb**)
40° turn	**2565 kg** (**5655 lb**)	**2374 kg** (**5234 lb**)

Machine specifications and dimensions – 121F General specifications

The following specifications are common to 121F Z-bar and 121F XT model configurations, equipped with standard tire (335/80 R18 tires).

121F common to all buckets specifications (Z-bar and XT)

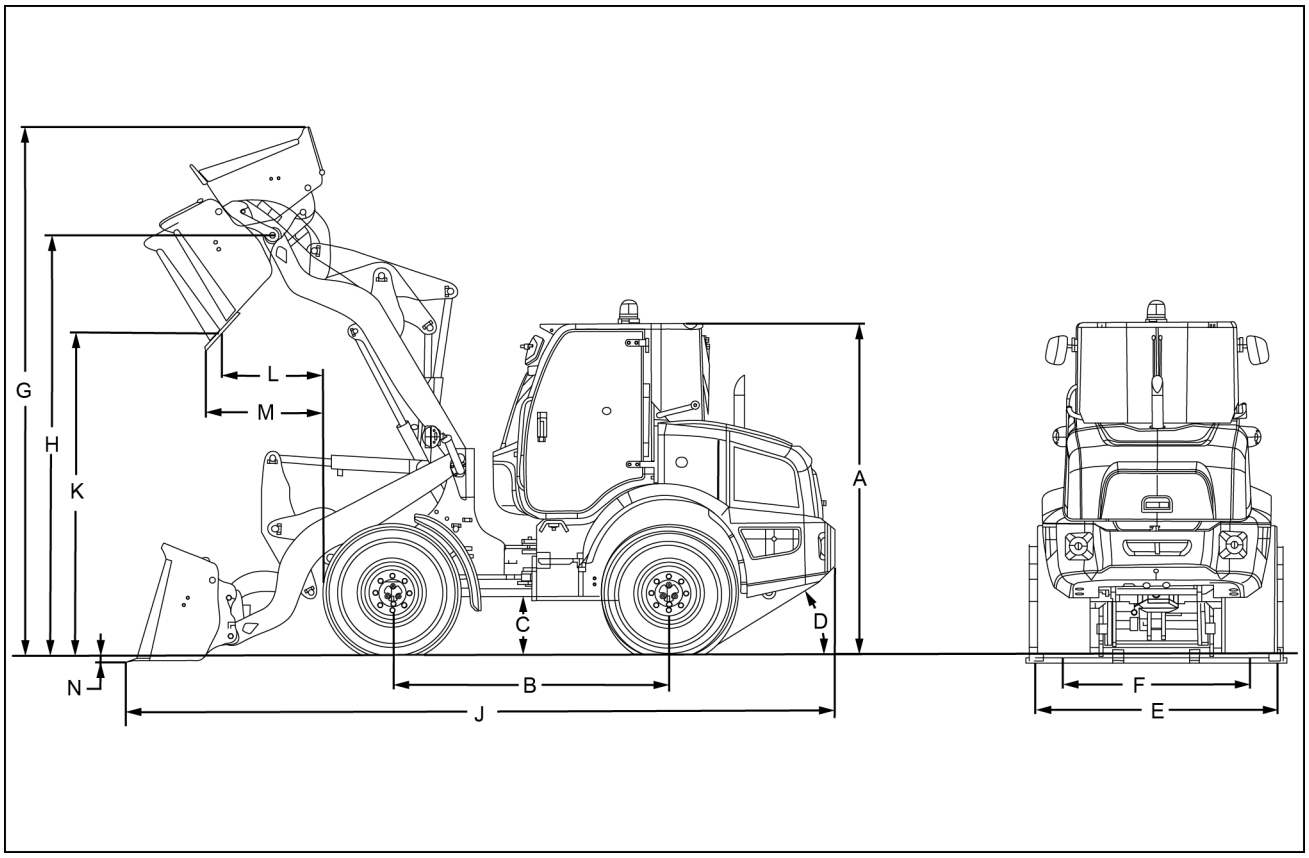
Feature	121F Z-bar	121F XT
Overall height (top of exhaust)	**2060 mm** (**81.1 in**)	**2060 mm** (**81.1 in**)
Turning radius (outside of tires)	**3721 mm** (**146.5 in**)	**3721 mm** (**146.5 in**)
Turning angle from center	**40°**	**40°**
Total turning angle	**80°**	**80°**
Rear axle oscillation total	**18°**	**18°**
Height to lower drawbar	**783 mm** (**30.8 in**)	**783 mm** (**30.8 in**)
Vertical wheel travel (trunnion fully oscillated)	**260 mm** (**10.2 in**)	**260 mm** (**10.2 in**)
Hinge pin height (carry position)	**409 mm** (**16.1 in**)	**387 mm** (**15.2 in**)
Implement cycle time	121F Z-bar	121F XT
Raising time – Loaded	**6.3 s**	**4.6 s**
Lowering time – Empty power down	**3.8 s**	**3.8 s**
Dump time – Loaded	**1.7 s**	**1.4 s**

Glossary

A table of the acronyms used in this section, is reported.

Bucket acronyms	
Acronym	Definition
GP	General Purpose
LM	Light Material
MP (4x1)	Multi Purpose (4x1)
Quick Coupler acronyms	
Acronym	Definition
HP	Horizontal Pin
SSL	Skid Steer Loader

121F Z-bar Loader - Lift Arm Specifications



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121F Z-bar Specifications - 0.8 m³ (1.05 yd³) GP Bucket on HP Quick Coupler (rear standard counterweight)

	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**0.6 m³ (0.78 yd³)**	**0.6 m³ (0.78 yd³)**	**0.6 m³ (0.78 yd³)**
Heaped	**0.8 m³ (1.05 yd³)**	**0.8 m³ (1.05 yd³)**	**0.8 m³ (1.05 yd³)**
Bucket width (maximum outer)	**2050 mm (80.7 in)**	**2050 mm (80.7 in)**	**2050 mm (80.7 in)**
Dimensional Outline Specifications			
A (top of cab height)	**2457 mm (96.7 in)**	**2457 mm (96.7 in)**	**2457 mm (96.7 in)**
B (wheelbase)	**2075 mm (81.7 in)**	**2075 mm (81.7 in)**	**2075 mm (81.7 in)**
C (ground clearance to cardan shaft)	**444 mm (17.5 in)**	**444 mm (17.5 in)**	**444 mm (17.5 in)**
D (rear angle of departure)	**28°**	**28°**	**28°**
E (overall width w/o bucket)	**1740 mm (68.5 in)**	**1740 mm (68.5 in)**	**1740 mm (68.5 in)**
F (tread width)	**1400 mm (55.1 in)**	**1400 mm (55.1 in)**	**1400 mm (55.1 in)**
G (overall height spillguard)	**4011 mm (157.9 in)**	**4011 mm (157.9 in)**	**4011 mm (157.9 in)**
H (hinge pin - fully raised)	**3182 mm (125.3 in)**	**3182 mm (125.3 in)**	**3182 mm (125.3 in)**
J (overall - bucket level on ground)	**5387 mm (212.1 in)**	**5439 mm (214.1 in)**	**5508 mm (216.9 in)**
K (dump - fully raised, **45°** dump)	**2521 mm (99.3 in)**	**2484 mm (97.8 in)**	**2435 mm (95.9 in)**
L (reach - fully raised, **45°** dump)	**825 mm (32.5 in)**	**862 mm (33.9 in)**	**911 mm (35.9 in)**
M (reach - **2.13 m (7.0 ft)**, **45°** dump)	**1185 mm (46.7 in)**	**1195 mm (47.0 in)**	**1205 mm (47.4 in)**
N (dig depth)	**114 mm (4.4 in)**	**114 mm (4.5 in)**	**114 mm (4.5 in)**
ISO Load Specifications			
Operating load	**1617 kg (3565 lb)**	**1588 kg (3501 lb)**	**1601 kg (3530 lb)**
Tipping load – machine straight	**3874 kg (8541 lb)**	**3808 kg (8395 lb)**	**3835 kg (8455 lb)**
Tipping load – 40° turn	**3235 kg (7132 lb)**	**3177 kg (7004 lb)**	**3202 kg (7059 lb)**

121F Z-bar Specifications - 1.1 m³ (1.44 yd³) LM Bucket on HP Quick Coupler (rear standard counterweight)

	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**0.9 m³** (**1.18 yd³**)	**0.9 m³** (**1.18 yd³**)	**0.9 m³** (**1.18 yd³**)
Heaped	**1.1 m³** (**1.44 yd³**)	**1.1 m³** (**1.44 yd³**)	**1.1 m³** (**1.44 yd³**)
Bucket width (maximum outer)	**2100 mm** (**82.7 in**)	**2100 mm** (**82.7 in**)	**2100 mm** (**82.7 in**)
Dimensional Outline Specifications			
A (top of cab height)	**2457 mm** (**96.7 in**)	**2457 mm** (**96.7 in**)	**2457 mm** (**96.7 in**)
B (wheelbase)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)
C (ground clearance to cardan shaft)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)
D (rear angle of departure)	**28°**	**28°**	**28°**
E (overall width w/o bucket)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)
F (tread width)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)
G (overall height spillguard)	**4133 mm** (**162.7 in**)	**4132 mm** (**162.7 in**)	**4133 mm** (**162.7 in**)
H (hinge pin - fully raised)	**3182 mm** (**125.3 in**)	**3182 mm** (**125.3 in**)	**3182 mm** (**125.3 in**)
J (overall - bucket level on ground)	**5497 mm** (**216.4 in**)	**5549 mm** (**218.5 in**)	**5618 mm** (**221.2 in**)
K (dump - fully raised, **45°** dump)	**2443 mm** (**96.2 in**)	**2406 mm** (**94.7 in**)	**2357 mm** (**92.8 in**)
L (reach - fully raised, **45°** dump)	**903 mm** (**35.6 in**)	**939 mm** (**37.0 in**)	**988 mm** (**38.9 in**)
M (reach - **2.13 m** (**7.0 ft**), **45°** dump)	**1204 mm** (**47.4 in**)	**1210 mm** (**47.6 in**)	**1217 mm** (**47.9 in**)
N (dig depth)	**114 mm** (**4.5 in**)	**114 mm** (**4.5 in**)	**114 mm** (**4.5 in**)
ISO Load Specifications			
Operating load	**1722 kg** (**3796 lb**)	**1694 kg** (**3735 lb**)	**1707 kg** (**3763 lb**)
Tipping load – machine straight	**4002 kg** (**8823 lb**)	**3840 kg** (**8466 lb**)	**3962 kg** (**8735 lb**)
Tipping load – 40° turn	**3445 kg** (**7595 lb**)	**3387 kg** (**7467 lb**)	**3414 kg** (**7527 lb**)

121F Z-bar Specifications - 0.80 m³ (1.05 yd³) MP (4x1) Bucket on HP Quick Coupler (rear standard counterweight)

	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**0.6 m³** (**0.78 yd³**)	**0.6 m³** (**0.78 yd³**)	**0.6 m³** (**0.78 yd³**)
Heaped	**0.8 m³** (**1.05 yd³**)	**0.8 m³** (**1.05 yd³**)	**0.8 m³** (**1.05 yd³**)
Bucket width (maximum outer)	**2050 mm** (**80.7 in**)	**2050 mm** (**80.7 in**)	**2050 mm** (**80.7 in**)
Dimensional Outline Specifications			
A (top of cab height)	**2457 mm** (**96.7 in**)	**2457 mm** (**96.7 in**)	**2457 mm** (**96.7 in**)
B (wheelbase)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)
C (ground clearance to cardan shaft)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)
D (rear angle of departure)	**28°**	**28°**	**28°**
E (overall width w/o bucket)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)
F (tread width)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)
G (overall height spillguard)	**4162 mm** (**163.9 in**)	**4161 mm** (**163.8 in**)	**4162 mm** (**163.9 in**)
H (hinge pin - fully raised)	**3182 mm** (**125.3 in**)	**3182 mm** (**125.3 in**)	**3182 mm** (**125.3 in**)
J (overall - bucket level on ground)	**5449 mm** (**214.5 in**)	**5500 mm** (**216.5 in**)	**5570 mm** (**219.3 in**)
K (dump - fully raised, **45°** dump)	**2477 mm** (**97.5 in**)	**2440 mm** (**96.1 in**)	**2391 mm** (**94.1 in**)
L (reach - fully raised, **45°** dump)	**868 mm** (**34.2 in**)	**905 mm** (**35.6 in**)	**954 mm** (**37.6 in**)
M (reach - **2.13 m** (**7.0 ft**), **45°** dump)	**1196 mm** (**47.1 in**)	**1204 mm** (**47.4 in**)	**1212 mm** (**47.7 in**)
N (dig depth)	**114 mm** (**4.5 in**)	**114 mm** (**4.5 in**)	**114 mm** (**4.5 in**)
ISO Load Specifications			
Operating load	**1532 kg** (**3377 lb**)	**1559 kg** (**3437 lb**)	**1573 kg** (**3468 lb**)
Tipping load – machine straight	**3572 kg** (**7875 lb**)	**3638 kg** (**8020 lb**)	**3665 kg** (**8080 lb**)
Tipping load – 40° turn	**3063 kg** (**6753 lb**)	**3118 kg** (**6874 lb**)	**3145 kg** (**6934 lb**)

121F Z-bar Specifications - 0.8 m³ (1.05 yd³) GP Bucket on SSL Quick Coupler (rear standard counterweight)

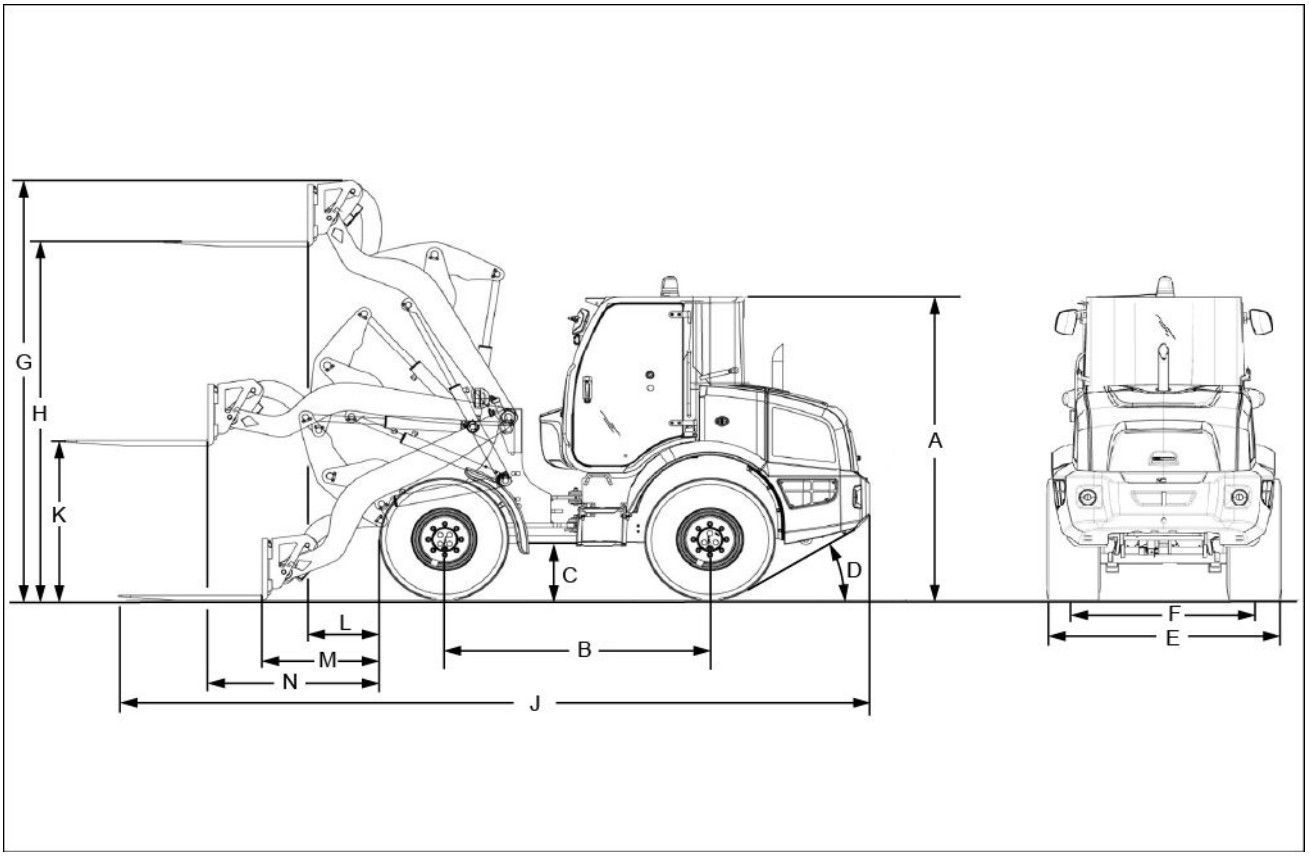
	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**0.6 m³ (0.78 yd³)**	**0.6 m³ (0.78 yd³)**	**0.6 m³ (0.78 yd³)**
Heaped	**0.8 m³ (1.05 yd³)**	**0.8 m³ (1.05 yd³)**	**0.8 m³ (1.05 yd³)**
Bucket width (maximum outer)	**2050 mm (80.7 in)**	**2050 mm (80.7 in)**	**2050 mm (80.7 in)**
Dimensional Outline Specifications			
A (top of cab height)	**2457 mm (96.7 in)**	**2457 mm (96.7 in)**	**2457 mm (96.7 in)**
B (wheelbase)	**2075 mm (81.7 in)**	**2075 mm (81.7 in)**	**2075 mm (81.7 in)**
C (ground clearance to cardan shaft)	**444 mm (17.5 in)**	**444 mm (17.5 in)**	**444 mm (17.5 in)**
D (rear angle of departure)	**28°**	**28°**	**28°**
E (overall width w/o bucket)	**1740 mm (68.5 in)**	**1740 mm (68.5 in)**	**1740 mm (68.5 in)**
F (tread width)	**1400 mm (55.1 in)**	**1400 mm (55.1 in)**	**1400 mm (55.1 in)**
G (overall height spillguard)	**4154 mm (163.5 in)**	**4154 mm (163.5 in)**	**4154 mm (163.5 in)**
H (hinge pin - fully raised)	**3182 mm (125.3 in)**	**3182 mm (125.3 in)**	**3182 mm (125.3 in)**
J (overall - bucket level on ground)	**5524 mm (217.5 in)**	**5575 mm (219.5 in)**	**5645 mm (222.2 in)**
K (dump - fully raised, **45°** dump)	**2424 mm (95.4 in)**	**2388 mm (94.0 in)**	**2339 mm (92.1 in)**
L (reach - fully raised, **45°** dump)	**924 mm (36.4 in)**	**960 mm (37.8 in)**	**1009 mm (39.7 in)**
M (reach - **2.13 m (7.0 ft)**, **45°** dump)	**1210 mm (47.6 in)**	**1216 mm (47.9 in)**	**1222 mm (48.1 in)**
N (dig depth)	**112 mm (4.4 in)**	**112 mm (4.4 in)**	**112 mm (4.4 in)**
ISO Load Specifications			
Operating load	**1568 kg (3457 lb)**	**1539 kg (3393 lb)**	**1564 kg (3448 lb)**
Tipping load – machine straight	**3747 kg (8261 lb)**	**3691 kg (8137 lb)**	**3713 kg (8186 lb)**
Tipping load – 40° turn	**3135 kg (6911 lb)**	**3079 kg (6788 lb)**	**3129 kg (6898 lb)**

121F Z-bar Specifications - 1.1 m³ (1.44 yd³) LM Bucket on SSL Quick Coupler (rear standard counterweight)

	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**0.9 m³ (1.18 yd³)**	**0.9 m³ (1.18 yd³)**	**0.9 m³ (1.18 yd³)**
Heaped	**1.1 m³ (1.44 yd³)**	**1.1 m³ (1.44 yd³)**	**1.1 m³ (1.44 yd³)**
Bucket width (maximum outer)	**2100 mm (82.7 in)**	**2100 mm (82.7 in)**	**2100 mm (82.7 in)**
Dimensional Outline Specifications			
A (top of cab height)	**2457 mm (96.7 in)**	**2457 mm (96.7 in)**	**2457 mm (96.7 in)**
B (wheelbase)	**2075 mm (81.7 in)**	**2075 mm (81.7 in)**	**2075 mm (81.7 in)**
C (ground clearance to cardan shaft)	**444 mm (17.5 in)**	**444 mm (17.5 in)**	**444 mm (17.5 in)**
D (rear angle of departure)	**28°**	**28°**	**28°**
E (overall width w/o bucket)	**1740 mm (68.5 in)**	**1740 mm (68.5 in)**	**1740 mm (68.5 in)**
F (tread width)	**1400 mm (55.1 in)**	**1400 mm (55.1 in)**	**1400 mm (55.1 in)**
G (overall height spillguard)	**4301 mm (169.3 in)**	**4301 mm (169.3 in)**	**4301 mm (169.3 in)**
H (hinge pin - fully raised)	**3182 mm (125.3 in)**	**3182 mm (125.3 in)**	**3182 mm (125.3 in)**
J (overall - bucket level on ground)	**5623 mm (221.4 in)**	**5744 mm (226.1 in)**	**5674 mm (223.4 in)**
K (dump - fully raised, **45°** dump)	**2354 mm (92.7 in)**	**2268 mm (89.3 in)**	**2318 mm (91.3 in)**
L (reach - fully raised, **45°** dump)	**994 mm (39.1 in)**	**1079 mm (42.5 in)**	**1030 mm (40.6 in)**
M (reach - **2.13 m (7.0 ft)**, **45°** dump)	**1220 mm (48.0 in)**	**1225 mm (48.2 in)**	**1223 mm (48.1 in)**
N (dig depth)	**112 mm (4.4 in)**	**112 mm (4.4 in)**	**112 mm (4.4 in)**
ISO Load Specifications			
Operating load	**1622 kg (3576 lb)**	**1617 kg (3565 lb)**	**1627 kg (3587 lb)**
Tipping load – machine straight	**3767 kg (8305 lb)**	**3731 kg (8225 lb)**	**3729 kg (8221 lb)**
Tipping load – 40° turn	**3245 kg (7154 lb)**	**3234 kg (7130 lb)**	**3253 kg (7172 lb)**

121F Z-bar Specifications - 0.80 m³ (1.05 yd³) MP (4x1) Bucket on SSL Quick Coupler (rear standard counterweight)

	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**0.6 m³** (**0.78 yd³**)	**0.6 m³** (**0.78 yd³**)	**0.6 m³** (**0.78 yd³**)
Heaped	**0.8 m³** (**1.05 yd³**)	**0.8 m³** (**1.05 yd³**)	**0.8 m³** (**1.05 yd³**)
Bucket width (maximum outer)	**2050 mm** (**80.7 in**)	**2050 mm** (**80.7 in**)	**2050 mm** (**80.7 in**)
Dimensional Outline Specifications			
A (top of cab height)	**2457 mm** (**96.7 in**)	**2457 mm** (**96.7 in**)	**2457 mm** (**96.7 in**)
B (wheelbase)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)
C (ground clearance to cardan shaft)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)
D (rear angle of departure)	**28°**	**28°**	**28°**
E (overall width w/o bucket)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)
F (tread width)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)
G (overall height spillguard)	**4212 mm** (**165.8 in**)	**4212 mm** (**165.8 in**)	**4212 mm** (**165.8 in**)
H (hinge pin - fully raised)	**3182 mm** (**125.3 in**)	**3182 mm** (**125.3 in**)	**3182 mm** (**125.3 in**)
J (overall - bucket level on ground)	**5522 mm** (**217.4 in**)	**5573 mm** (**219.4 in**)	**5643 mm** (**222.2 in**)
K (dump - fully raised, **45°** dump)	**2425 mm** (**95.5 in**)	**2388 mm** (**94.0 in**)	**2339 mm** (**92.1 in**)
L (reach - fully raised, **45°** dump)	**921 mm** (**36.3 in**)	**958 mm** (**37.7 in**)	**1007 mm** (**39.6 in**)
M (reach - **2.13 m** (**7.0 ft**), **45°** dump)	**1208 mm** (**47.6 in**)	**1214 mm** (**47.8 in**)	**1220 mm** (**48.0 in**)
N (dig depth)	**113 mm** (**4.4 in**)	**114 mm** (**4.5 in**)	**113 mm** (**4.4 in**)
ISO Load Specifications			
Operating load	**1486 kg** (**3276 lb**)	**1463 kg** (**3225 lb**)	**1473 kg** (**3247 lb**)
Tipping load – machine straight	**3460 kg** (**7628 lb**)	**3401 kg** (**7498 lb**)	**3427 kg** (**7555 lb**)
Tipping load – 40° turn	**2973 kg** (**6554 lb**)	**2926 kg** (**6451 lb**)	**2947 kg** (**6497 lb**)



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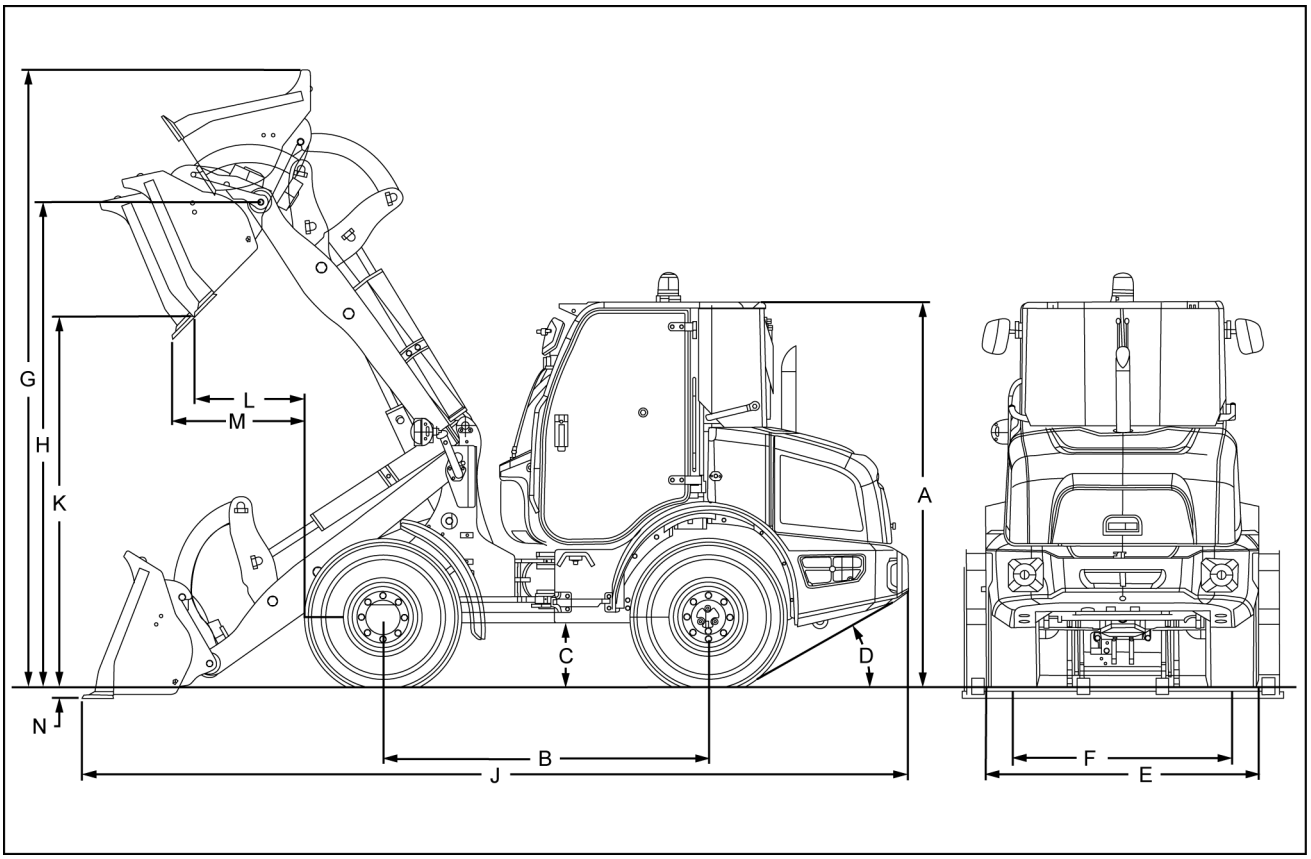
121F Z-bar Specifications - Standard forks (rear standard counterweight)

	HP Quick Coupler	SSL Quick Coupler
Forks Specifications		
Fork length	**1200 mm** (**47.2 in**)	**1200 mm** (**47.2 in**)
Fork maximum width (outside to outside of tine)	**956 mm** (**37.6 in**)	**956 mm** (**37.6 in**)
Dimensional Outline Specifications		
A (top of cab height)	**2457 mm** (**96.7 in**)	**2457 mm** (**96.7 in**)
B (wheelbase)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)
C (ground clearance to cardan shaft)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)
D (rear angle of departure)	**28°**	**28°**
E (overall width w/o bucket)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)
F (tread width)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)
G (overall height – operating top of attachment)	**3530 mm** (**139.0 in**)	**3689 mm** (**145.2 in**)
H (ground clearance to top of tine – fully raised)	**2950 mm** (**116.1 in**)	**3030 mm** (**119.3 in**)
J (overall - forks level on ground)	**6062 mm** (**238.7 in**)	**6232 mm** (**245.4 in**)
K (reach – ground clearance to top of tine)	**1265 mm** (**49.8 in**)	**1344 mm** (**52.9 in**)
L (reach - fully raised, vertical front surface of tine)	**633 mm** (**24.9 in**)	**803 mm** (**31.6 in**)
M (reach – ground to vertical front surface of tine)	**1015 mm** (**40.0 in**)	**1127 mm** (**44.4 in**)
N (maximum reach – vertical front surface of tine)	**1416 mm** (**55.7 in**)	**1585 mm** (**62.4 in**)
Load Specifications (EN 474–3)		
Operating load		
Rough terrain	**1434 kg** (**3161 lb**)	**1332 kg** (**2937 lb**)
Firm and level ground	**1912 kg** (**4215 lb**)	**1777 kg** (**3918 lb**)
ISO Load Specifications		
Tipping load		
Machine straight	**2764 kg** (**6094 lb**)	**2572 kg** (**5670 lb**)
40° turn	**2390 kg** (**5269 lb**)	**2221 kg** (**4896 lb**)

121F XT Loader - Lift Arm Specifications



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121F XT Specifications - 0.8 m³ (1.05 yd³) GP Bucket on HP Quick Coupler (rear standard counterweight)

	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**0.6 m³** (**0.78 yd³**)	**0.6 m³** (**0.78 yd³**)	**0.6 m³** (**0.78 yd³**)
Heaped	**0.8 m³** (**1.05 yd³**)	**0.8 m³** (**1.05 yd³**)	**0.8 m³** (**1.05 yd³**)
Bucket width (maximum outer)	**2050 mm** (**80.7 in**)	**2050 mm** (**80.7 in**)	**2050 mm** (**80.7 in**)
Dimensional Outline Specifications			
A (top of cab height)	**2457 mm** (**96.7 in**)	**2457 mm** (**96.7 in**)	**2457 mm** (**96.7 in**)
B (wheelbase)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)
C (ground clearance to cardan shaft)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)
D (rear angle of departure)	**28°**	**28°**	**28°**
E (overall width w/o bucket)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)
F (tread width)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)
G (overall height spillguard)	**3966 mm** (**156.1 in**)	**3966 mm** (**156.1 in**)	**3966 mm** (**156.1 in**)
H (hinge pin - fully raised)	**3128 mm** (**123.1 in**)	**3128 mm** (**123.1 in**)	**3128 mm** (**123.1 in**)
J (overall - bucket level on ground)	**5221 mm** (**205.6 in**)	**5272 mm** (**207.6 in**)	**5342 mm** (**210.3 in**)
K (dump - fully raised, **45°** dump)	**2446 mm** (**96.3 in**)	**2396 mm** (**94.3 in**)	**2342 mm** (**92.2 in**)
L (reach - fully raised, **45°** dump)	**682 mm** (**26.9 in**)	**705 mm** (**27.8 in**)	**750 mm** (**29.5 in**)
M (reach - **2.13 m** (**7.0 ft**), **45°** dump)	**1014 mm** (**39.9 in**)	**995 mm** (**39.2 in**)	**988 mm** (**38.9 in**)
N (dig depth)	**141 mm** (**5.6 in**)	**141 mm** (**5.6 in**)	**141 mm** (**5.6 in**)
ISO Load Specifications			
Operating load	**1655 kg** (**3649 lb**)	**1627 kg** (**3587 lb**)	**1640 kg** (**3614 lb**)
Tipping load – machine straight	**3830 kg** (**8444 lb**)	**3766 kg** (**8303 lb**)	**3794 kg** (**8364 lb**)
Tipping load – 40° turn	**3310 kg** (**7297 lb**)	**3253 kg** (**7172 lb**)	**3279 kg** (**7229 lb**)

121F XT Specifications - 1.1 m³ (1.44 yd³) LM Bucket on HP Quick Coupler (rear standard counterweight)

	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**0.9 m³ (1.18 yd³)**	**0.9 m³ (1.18 yd³)**	**0.9 m³ (1.18 yd³)**
Heaped	**1.1 m³ (1.44 yd³)**	**1.1 m³ (1.44 yd³)**	**1.1 m³ (1.44 yd³)**
Bucket width (maximum outer)	**2100 mm (82.7 in)**	**2100 mm (82.7 in)**	**2100 mm (82.7 in)**
Dimensional Outline Specifications			
A (top of cab height)	**2457 mm (96.7 in)**	**2457 mm (96.7 in)**	**2457 mm (96.7 in)**
B (wheelbase)	**2075 mm (81.7 in)**	**2075 mm (81.7 in)**	**2075 mm (81.7 in)**
C (ground clearance to cardan shaft)	**444 mm (17.5 in)**	**444 mm (17.5 in)**	**444 mm (17.5 in)**
D (rear angle of departure)	**28°**	**28°**	**28°**
E (overall width w/o bucket)	**1740 mm (68.5 in)**	**1740 mm (68.5 in)**	**1740 mm (68.5 in)**
F (tread width)	**1400 mm (55.1 in)**	**1400 mm (55.1 in)**	**1400 mm (55.1 in)**
G (overall height spillguard)	**4103 mm (161.5 in)**	**4103 mm (161.5 in)**	**4103 mm (161.5 in)**
H (hinge pin - fully raised)	**3128 mm (123.1 in)**	**3128 mm (123.1 in)**	**3128 mm (123.1 in)**
J (overall - bucket level on ground)	**5355 mm (210.8 in)**	**5406 mm (212.8 in)**	**5476 mm (215.6 in)**
K (dump - fully raised, **45°** dump)	**2351 mm (92.6 in)**	**2301 mm (90.6 in)**	**2247 mm (88.5 in)**
L (reach - fully raised, **45°** dump)	**778 mm (30.6 in)**	**801 mm (31.5 in)**	**845 mm (33.3 in)**
M (reach - **2.13 m (7.0 ft)**, **45°** dump)	**1017 mm (40.0 in)**	**882 mm (34.7 in)**	**1001 mm (39.4 in)**
N (dig depth)	**141 mm (5.6 in)**	**141 mm (5.6 in)**	**141 mm (5.6 in)**
ISO Load Specifications			
Operating load	**1616 kg (3563 lb)**	**1589 kg (3502 lb)**	**1601 kg (3530 lb)**
Tipping load – machine straight	**3740 kg (8245 lb)**	**3680 kg (8113 lb)**	**3710 kg (8179 lb)**
Tipping load – 40° turn	**3231 kg (7123 lb)**	**3177 kg (7004 lb)**	**3202 kg (7059 lb)**

121F XT Specifications - 0.8 m³ (1.05 yd³) MP (4x1) Bucket on HP Quick Coupler (rear standard counterweight)

	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**0.6 m³ (0.78 yd³)**	**0.6 m³ (0.78 yd³)**	**0.6 m³ (0.78 yd³)**
Heaped	**0.8 m³ (1.05 yd³)**	**0.8 m³ (1.05 yd³)**	**0.8 m³ (1.05 yd³)**
Bucket width (maximum outer)	**2050 mm (80.7 in)**	**2050 mm (80.7 in)**	**2050 mm (80.7 in)**
Dimensional Outline Specifications			
A (top of cab height)	**2457 mm (96.7 in)**	**2457 mm (96.7 in)**	**2457 mm (96.7 in)**
B (wheelbase)	**2075 mm (81.7 in)**	**2075 mm (81.7 in)**	**2075 mm (81.7 in)**
C (ground clearance to cardan shaft)	**444 mm (17.5 in)**	**444 mm (17.5 in)**	**444 mm (17.5 in)**
D (rear angle of departure)	**28°**	**28°**	**28°**
E (overall width w/o bucket)	**1740 mm (68.5 in)**	**1740 mm (68.5 in)**	**1740 mm (68.5 in)**
F (tread width)	**1400 mm (55.1 in)**	**1400 mm (55.1 in)**	**1400 mm (55.1 in)**
G (overall height spillguard)	**4087 mm (160.9 in)**	**4087 mm (160.9 in)**	**4087 mm (160.9 in)**
H (hinge pin - fully raised)	**3128 mm (123.1 in)**	**3128 mm (123.1 in)**	**3128 mm (123.1 in)**
J (overall - bucket level on ground)	**5208 mm (205.0 in)**	**5259.6 mm (207.1 in)**	**5329 mm (209.8 in)**
K (dump - fully raised, **45°** dump)	**2456 mm (96.7 in)**	**2406 mm (94.7 in)**	**2351 mm (92.6 in)**
L (reach - fully raised, **45°** dump)	**673 mm (26.5 in)**	**696 mm (27.4 in)**	**737 mm (29.0 in)**
M (reach - **2.13 m (7.0 ft)**, **45°** dump)	**1005 mm (39.6 in)**	**985 mm (38.8 in)**	**979 mm (38.5 in)**
N (dig depth)	**141 mm (5.6 in)**	**141 mm (5.6 in)**	**141 mm (5.6 in)**
ISO Load Specifications			
Operating load	**1518 kg (3347 lb)**	**1490 kg (3285 lb)**	**1503 kg (3314 lb)**
Tipping load – machine straight	**3522 kg (7765 lb)**	**3461 kg (7630 lb)**	**3490 kg (7694 lb)**
Tipping load – 40° turn	**3035 kg (6691 lb)**	**2980 kg (6570 lb)**	**3006 kg (6627 lb)**

121F XT Specifications - 0.8 m³ (1.05 yd³) GP Bucket on SSL Quick Coupler (rear standard counterweight)

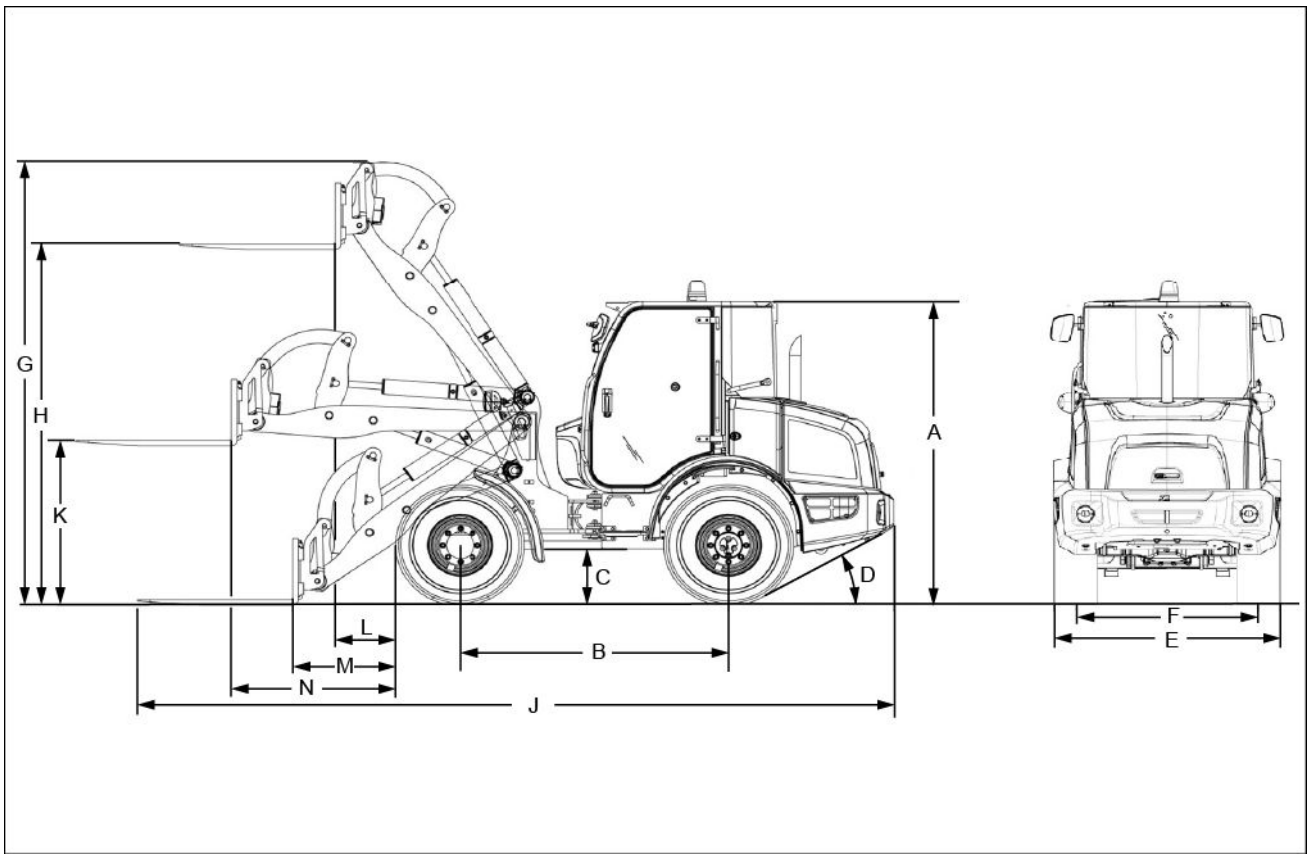
	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**0.6 m³** (**0.78 yd³**)	**0.6 m³** (**0.78 yd³**)	**0.6 m³** (**0.78 yd³**)
Heaped	**0.8 m³** (**1.05 yd³**)	**0.8 m³** (**1.05 yd³**)	**0.8 m³** (**1.05 yd³**)
Bucket width (maximum outer)	**2050 mm** (**80.7 in**)	**2050 mm** (**80.7 in**)	**2050 mm** (**80.7 in**)
Dimensional Outline Specifications			
A (top of cab height)	**2457 mm** (**96.7 in**)	**2457 mm** (**96.7 in**)	**2457 mm** (**96.7 in**)
B (wheelbase)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)
C (ground clearance to cardan shaft)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)
D (rear angle of departure)	**28°**	**28°**	**28°**
E (overall width w/o bucket)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)
F (tread width)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)
G (overall height spillguard)	**4085 mm** (**160.8 in**)	**4085 mm** (**160.8 in**)	**4085 mm** (**160.8 in**)
H (hinge pin - fully raised)	**3128 mm** (**123.1 in**)	**3128 mm** (**123.1 in**)	**3128 mm** (**123.1 in**)
J (overall - bucket level on ground)	**5305 mm** (**208.9 in**)	**5356.6 mm** (**210.9 in**)	**5426 mm** (**213.6 in**)
K (dump - fully raised, **45°** dump)	**2395 mm** (**94.3 in**)	**2345 mm** (**92.3 in**)	**2292 mm** (**90.2 in**)
L (reach - fully raised, **45°** dump)	**755 mm** (**29.7 in**)	**778 mm** (**30.6 in**)	**824 mm** (**32.4 in**)
M (reach - **2.13 m** (**7.0 ft**), **45°** dump)	**1025 mm** (**40.4 in**)	**1011 mm** (**39.8 in**)	**1005 mm** (**39.6 in**)
N (dig depth)	**143 mm** (**5.6 in**)	**143 mm** (**5.6 in**)	**143 mm** (**5.6 in**)
ISO Load Specifications			
Operating load	**1621 kg** (**3574 lb**)	**1594 kg** (**3514 lb**)	**1607 kg** (**3543 lb**)
Tipping load – machine straight	**3750 kg** (**8267 lb**)	**3690 kg** (**8135 lb**)	**3718 kg** (**8197 lb**)
Tipping load – 40° turn	**3242 kg** (**7147 lb**)	**3188 kg** (**7028 lb**)	**3213 kg** (**7083 lb**)

121F XT Specifications - 1.1 m³ (1.44 yd³) LM Bucket on SSL Quick Coupler (rear standard counterweight)

	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**0.9 m³** (**1.18 yd³**)	**0.9 m³** (**1.18 yd³**)	**0.9 m³** (**1.18 yd³**)
Heaped	**1.1 m³** (**1.44 yd³**)	**1.1 m³** (**1.44 yd³**)	**1.1 m³** (**1.44 yd³**)
Bucket width (maximum outer)	**2100 mm** (**82.7 in**)	**2100 mm** (**82.7 in**)	**2100 mm** (**82.7 in**)
Dimensional Outline Specifications			
A (top of cab height)	**2457 mm** (**96.7 in**)	**2457 mm** (**96.7 in**)	**2457 mm** (**96.7 in**)
B (wheelbase)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)
C (ground clearance to cardan shaft)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)
D (rear angle of departure)	**28°**	**28°**	**28°**
E (overall width w/o bucket)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)
F (tread width)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)
G (overall height spillguard)	**4218 mm** (**166.1 in**)	**4218 mm** (**166.1 in**)	**4218 mm** (**166.1 in**)
H (hinge pin - fully raised)	**3128 mm** (**123.1 in**)	**3128 mm** (**123.1 in**)	**3128 mm** (**123.1 in**)
J (overall - bucket level on ground)	**5404 mm** (**212.8 in**)	**5455.6 mm** (**214.8 in**)	**5525 mm** (**217.5 in**)
K (dump - fully raised, **45°** dump)	**2326 mm** (**91.6 in**)	**2276 mm** (**89.6 in**)	**2223 mm** (**87.5 in**)
L (reach - fully raised, **45°** dump)	**826 mm** (**32.5 in**)	**850 mm** (**33.5 in**)	**895 mm** (**35.2 in**)
M (reach - **2.13 m** (**7.0 ft**), **45°** dump)	**1041 mm** (**41.0 in**)	**1015 mm** (**40.0 in**)	**1002 mm** (**39.4 in**)
N (dig depth)	**143 mm** (**5.6 in**)	**143 mm** (**5.6 in**)	**143 mm** (**5.6 in**)
ISO Load Specifications			
Operating load	**1602 kg** (**3531 lb**)	**1575 kg** (**3472 lb**)	**1587 kg** (**3499 lb**)
Tipping load – machine straight	**3706 kg** (**8170 lb**)	**3646 kg** (**8038 lb**)	**3674 kg** (**8100 lb**)
Tipping load – 40° turn	**3203 kg** (**7061 lb**)	**3150 kg** (**6945 lb**)	**3174 kg** (**6997 lb**)

121F XT Specifications - 0.8 m³ (1.05 yd³) MP (4x1) Bucket on SSL Quick Coupler (rear standard counterweight)

	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**0.6 m³** (**0.78 yd³**)	**0.6 m³** (**0.78 yd³**)	**0.6 m³** (**0.78 yd³**)
Heaped	**0.8 m³** (**1.05 yd³**)	**0.8 m³** (**1.05 yd³**)	**0.8 m³** (**1.05 yd³**)
Bucket width (maximum outer)	**2050 mm** (**80.7 in**)	**2050 mm** (**80.7 in**)	**2050 mm** (**80.7 in**)
Dimensional Outline Specifications			
A (top of cab height)	**2457 mm** (**96.7 in**)	**2457 mm** (**96.7 in**)	**2457 mm** (**96.7 in**)
B (wheelbase)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)
C (ground clearance to cardan shaft)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)
D (rear angle of departure)	**28°**	**28°**	**28°**
E (overall width w/o bucket)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)
F (tread width)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)
G (overall height spillguard)	**4161 mm** (**163.8 in**)	**4161 mm** (**163.8 in**)	**4161 mm** (**163.8 in**)
H (hinge pin - fully raised)	**3128 mm** (**123.1 in**)	**3128 mm** (**123.1 in**)	**3128 mm** (**123.1 in**)
J (overall - bucket level on ground)	**5216 mm** (**205.4 in**)	**5268 mm** (**207.4 in**)	**5335 mm** (**210.0 in**)
K (dump - fully raised, **45°** dump)	**2397 mm** (**94.4 in**)	**2348 mm** (**92.4 in**)	**2294 mm** (**90.3 in**)
L (reach - fully raised, **45°** dump)	**750 mm** (**29.5 in**)	**773 mm** (**30.4 in**)	**818 mm** (**32.2 in**)
M (reach - **2.13 m** (**7.0 ft**), **45°** dump)	**1031 mm** (**40.6 in**)	**1009 mm** (**39.7 in**)	**1001 mm** (**39.4 in**)
N (dig depth)	**143 mm** (**5.6 in**)	**143 mm** (**5.6 in**)	**143 mm** (**5.6 in**)
ISO Load Specifications			
Operating load	**1481 kg** (**3265 lb**)	**1454 kg** (**3204 lb**)	**1466 kg** (**3232 lb**)
Tipping load – machine straight	**3436 kg** (**7575 lb**)	**3377 kg** (**7445 lb**)	**3405 kg** (**7507 lb**)
Tipping load – 40° turn	**2961 kg** (**6528 lb**)	**2907 kg** (**6409 lb**)	**2932 kg** (**6464 lb**)



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121F XT Specifications - Standard forks (rear standard counterweight)

	HP Quick Coupler	SSL Quick Coupler
Forks Specifications		
Fork length	**1200 mm** (**47.2 in**)	**1200 mm** (**47.2 in**)
Fork maximum width (outside to outside of tine)	**956 mm** (**37.6 in**)	**956 mm** (**37.6 in**)
Dimensional Outline Specifications		
A (top of cab height)	**2457 mm** (**96.7 in**)	**2457 mm** (**96.7 in**)
B (wheelbase)	**2075 mm** (**81.7 in**)	**2075 mm** (**81.7 in**)
C (ground clearance to cardan shaft)	**444 mm** (**17.5 in**)	**444 mm** (**17.5 in**)
D (rear angle of departure)	**28°**	**28°**
E (overall width w/o bucket)	**1740 mm** (**68.5 in**)	**1740 mm** (**68.5 in**)
F (tread width)	**1400 mm** (**55.1 in**)	**1400 mm** (**55.1 in**)
G (overall height – operating top of attachment)	**3645 mm** (**143.5 in**)	**3632 mm** (**143.0 in**)
H (ground clearance to top of tine – fully raised)	**2973 mm** (**117.0 in**)	**2976 mm** (**117.2 in**)
J (overall - forks level on ground)	**5844 mm** (**230.1 in**)	**5981 mm** (**235.5 in**)
K (reach – ground clearance to top of tine)	**1343 mm** (**52.9 in**)	**135 mm** (**53.2 in**)
L (reach - fully raised, vertical front surface of tine)	**472 mm** (**18.6 in**)	**605 mm** (**23.8 in**)
M (reach – ground to vertical front surface of tine)	**797 mm** (**31.4 in**)	**950 mm** (**37.4 in**)
N (maximum reach – vertical front surface of tine)	**1272 mm** (**50.1 in**)	**1414 mm** (**55.7 in**)
Load Specifications (EN 474–3)		
Operating load		
Rough terrain	**1534.2 kg** (**3382 lb**)	**1423 kg** (**3137 lb**)
Firm and level ground	**2045.6 kg** (**4511 lb**)	**1898 kg** (**4184 lb**)
ISO Load Specifications		
Tipping load		
Machine straight	**2957 kg** (**6519 lb**)	**2735 kg** (**6030 lb**)
40° turn	**2557 kg** (**5637 lb**)	**2372 kg** (**5229 lb**)

Machine specifications and dimensions – 221F General specifications

The following specifications are common to all 221F model configurations equipped with standard tire (365/70 R18 tires).

221F common to all buckets specifications

Feature	Specification
Overall height (top of exhaust)	**2230 mm** (**87.8 in**)
Turning radius (outside of tires)	**3987 mm** (**157.0 in**)
Turning angle from center	**40°**
Total turning angle	**80°**
Rear axle oscillation total	**20°**
Height to lower drawbar	**779 mm** (**30.7 in**)
Vertical wheel travel (trunnion fully oscillated)	**300 mm** (**11.8 in**)
Hinge pin height (carry position)	**388 mm** (**15.3 in**)

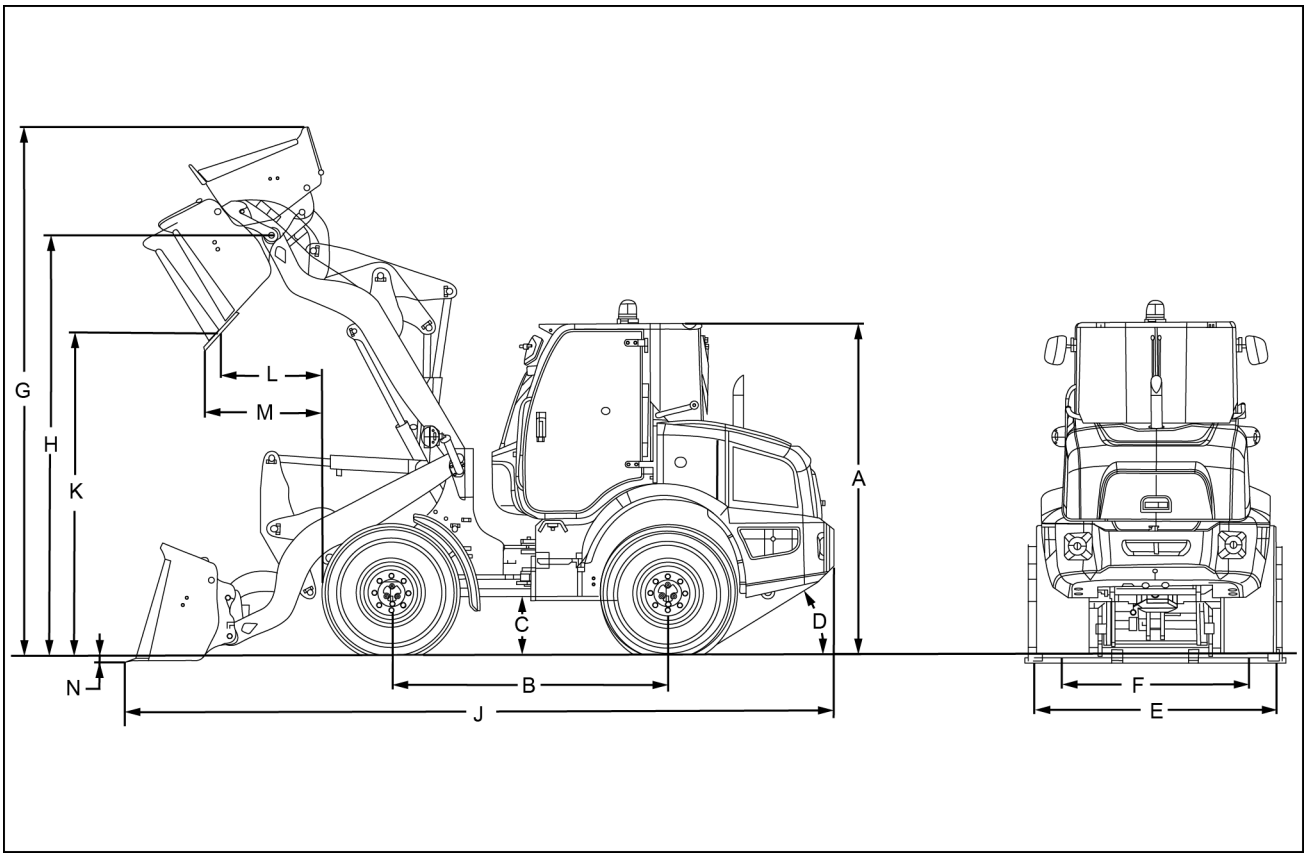
Implement cycle time	221F
Raising time – Loaded	**5.8 s**
Lowering time – Empty power down	**3.8 s**
Dump time – Loaded	**1.7 s**

Glossary

A table of the acronyms used in this section, is reported.

Bucket acronyms	
Acronym	Definition
GP	General Purpose
LM	Light Material
MP (4x1)	Multi Purpose (4x1)
Quick Coupler acronyms	
Acronym	Definition
HP	Horizontal Pin
SSL	Skid Steer Loader

221F Loader - Lift Arm Specifications



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221F Z-bar Specifications - 0.9 m³ (1.2 yd³) GP Bucket on HP Quick Coupler (rear standard counterweight)

	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**0.7 m³** (**0.92 yd³**)	**0.7 m³** (**0.92 yd³**)	**0.7 m³** (**0.92 yd³**)
Heaped	**0.9 m³** (**1.18 yd³**)	**0.9 m³** (**1.18 yd³**)	**0.9 m³** (**1.18 yd³**)
Bucket width (maximum outer)	**2050 mm** (**80.7 in**)	**2050 mm** (**80.7 in**)	**2050 mm** (**80.7 in**)
Dimensional Outline Specifications			
A (top of cab height)	**2627 mm** (**103.4 in**)	**2627 mm** (**103.4 in**)	**2627 mm** (**103.4 in**)
B (wheelbase)	**2225 mm** (**87.6 in**)	**2225 mm** (**87.6 in**)	**2225 mm** (**87.6 in**)
C (ground clearance to cardan shaft)	**440 mm** (**17.3 in**)	**440 mm** (**17.3 in**)	**440 mm** (**17.3 in**)
D (rear angle of departure)	**27°**	**27°**	**27°**
E (overall width w/o bucket)	**1860 mm** (**73.2 in**)	**1860 mm** (**73.2 in**)	**1860 mm** (**73.2 in**)
F (tread width)	**1500 mm** (**59.1 in**)	**1500 mm** (**59.1 in**)	**1500 mm** (**59.1 in**)
G (overall height spillguard)	**4180 mm** (**164.6 in**)	**4180 mm** (**164.6 in**)	**4180 mm** (**164.6 in**)
H (hinge pin - fully raised)	**3290 mm** (**129.5 in**)	**3290 mm** (**129.5 in**)	**3290 mm** (**129.5 in**)
J (overall - bucket level on ground)	**5622 mm** (**221.4 in**)	**5674 mm** (**223.4 in**)	**5743 mm** (**226.1 in**)
K (dump - fully raised, **45°** dump)	**2599 mm** (**102.3 in**)	**2563 mm** (**100.9 in**)	**2514 mm** (**99.0 in**)
L (reach - fully raised, **45°** dump)	**844 mm** (**33.2 in**)	**880 mm** (**34.6 in**)	**929 mm** (**36.6 in**)
M (reach - **2.13 m** (**7.0 ft**), **45°** dump)	**1263 mm** (**49.7 in**)	**1274 mm** (**50.2 in**)	**1288 mm** (**50.7 in**)
N (dig depth)	**100 mm** (**3.9 in**)	**100 mm** (**3.9 in**)	**100 mm** (**3.9 in**)
ISO Load Specifications			
Operating load	**1936 kg** (**4268 lb**)	**1907 kg** (**4204 lb**)	**1914 kg** (**4220 lb**)
Tipping load – machine straight	**4493 kg** (**9905 lb**)	**4435 kg** (**9778 lb**)	**4435 kg** (**9778 lb**)
Tipping load – 40° turn	**3872 kg** (**8536 lb**)	**3814 kg** (**8408 lb**)	**3828 kg** (**8439 lb**)

221F Z-bar Specifications - 1.2 m³ (1.6 yd³) LM Bucket on HP Quick Coupler (rear standard counterweight)

	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**1.0 m³ (1.31 yd³)**	**1.0 m³ (1.31 yd³)**	**1.0 m³ (1.31 yd³)**
Heaped	**1.2 m³ (1.57 yd³)**	**1.2 m³ (1.57 yd³)**	**1.2 m³ (1.57 yd³)**
Bucket width (maximum outer)	**2100 mm (82.7 in)**	**2100 mm (82.7 in)**	**2100 mm (82.7 in)**
Dimensional Outline Specifications			
A (top of cab height)	**2627 mm (103.4 in)**	**2627 mm (103.4 in)**	**2627 mm (103.4 in)**
B (wheelbase)	**2225 mm (87.6 in)**	**2225 mm (87.6 in)**	**2225 mm (87.6 in)**
C (ground clearance to cardan shaft)	**440 mm (17.3 in)**	**440 mm (17.3 in)**	**440 mm (17.3 in)**
D (rear angle of departure)	**27°**	**27°**	**27°**
E (overall width w/o bucket)	**1860 mm (73.2 in)**	**1860 mm (73.2 in)**	**1860 mm (73.2 in)**
F (tread width)	**1500 mm (59.1 in)**	**1500 mm (59.1 in)**	**1500 mm (59.1 in)**
G (overall height spillguard)	**4300 mm (169.3 in)**	**4300 mm (169.3 in)**	**4300 mm (169.3 in)**
H (hinge pin - fully raised)	**3290 mm (129.5 in)**	**3290 mm (129.5 in)**	**3290 mm (129.5 in)**
J (overall - bucket level on ground)	**5717 mm (225.1 in)**	**5769 mm (227.1 in)**	**5838 mm (229.9 in)**
K (dump - fully raised, **45°** dump)	**2532 mm (99.7 in)**	**2495 mm (98.2 in)**	**2446 mm (96.3 in)**
L (reach - fully raised, **45°** dump)	**911 mm (35.9 in)**	**947 mm (37.3 in)**	**997 mm (39.2 in)**
M (reach - **2.13 m (7.0 ft)**, **45°** dump)	**1283 mm (50.5 in)**	**1292 mm (50.9 in)**	**1303 mm (51.3 in)**
N (dig depth)	**100 mm (3.9 in)**	**100 mm (3.9 in)**	**100 mm (3.9 in)**
ISO Load Specifications			
Operating load	**1918 kg (4228 lb)**	**1889 kg (4165 lb)**	**1902 kg (4193 lb)**
Tipping load – machine straight	**4456 kg (9824 lb)**	**4398 kg (9696 lb)**	**4424 kg (9753 lb)**
Tipping load – 40° turn	**3836 kg (8457 lb)**	**3779 kg (8331 lb)**	**3804 kg (8386 lb)**

221F Z-bar Specifications - 0.9 m³ (1.2 yd³) MP (4x1) Bucket on HP Quick Coupler (rear standard counterweight)

	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**0.7 m³ (0.92 yd³)**	**0.7 m³ (0.92 yd³)**	**0.7 m³ (0.92 yd³)**
Heaped	**0.9 m³ (1.18 yd³)**	**0.9 m³ (1.18 yd³)**	**0.9 m³ (1.18 yd³)**
Bucket width (maximum outer)	**2050 mm (80.7 in)**	**2050 mm (80.7 in)**	**2050 mm (80.7 in)**
Dimensional Outline Specifications			
A (top of cab height)	**2627 mm (103.4 in)**	**2627 mm (103.4 in)**	**2627 mm (103.4 in)**
B (wheelbase)	**2225 mm (87.6 in)**	**2225 mm (87.6 in)**	**2225 mm (87.6 in)**
C (ground clearance to cardan shaft)	**440 mm (17.3 in)**	**440 mm (17.3 in)**	**440 mm (17.3 in)**
D (rear angle of departure)	**27°**	**27°**	**27°**
E (overall width w/o bucket)	**1860 mm (73.2 in)**	**1860 mm (73.2 in)**	**1860 mm (73.2 in)**
F (tread width)	**1500 mm (59.1 in)**	**1500 mm (59.1 in)**	**1500 mm (59.1 in)**
G (overall height spillguard)	**4276 mm (168.3 in)**	**4275 mm (168.3 in)**	**4275 mm (168.3 in)**
H (hinge pin - fully raised)	**3289 mm (129.5 in)**	**3289 mm (129.5 in)**	**3289 mm (129.5 in)**
J (overall - bucket level on ground)	**5742 mm (226.1 in)**	**5794 mm (228.1 in)**	**5863 mm (230.8 in)**
K (dump - fully raised, **45°** dump)	**2514 mm (99.0 in)**	**2477 mm (97.5 in)**	**2428 mm (95.6 in)**
L (reach - fully raised, **45°** dump)	**927 mm (36.5 in)**	**964 mm (37.9 in)**	**1013 mm (39.9 in)**
M (reach - **2.13 m (7.0 ft)**, **45°** dump)	**1286 mm (50.6 in)**	**1294 mm (51.0 in)**	**1304 mm (51.4 in)**
N (dig depth)	**100 mm (3.9 in)**	**100 mm (3.9 in)**	**100 mm (3.9 in)**
ISO Load Specifications			
Operating load	**1669 kg (3680 lb)**	**1683 kg (3710 lb)**	**1651 kg (3640 lb)**
Tipping load – machine straight	**4001 kg (8821 lb)**	**3922 kg (8647 lb)**	**3791 kg (8358 lb)**
Tipping load – 40° turn	**3337 kg (7357 lb)**	**3367 kg (7423 lb)**	**3303 kg (7282 lb)**

221F Z-bar Specifications - 0.9 m³ (1.2 yd³) GP Bucket on SSL Quick Coupler (rear standard counterweight)

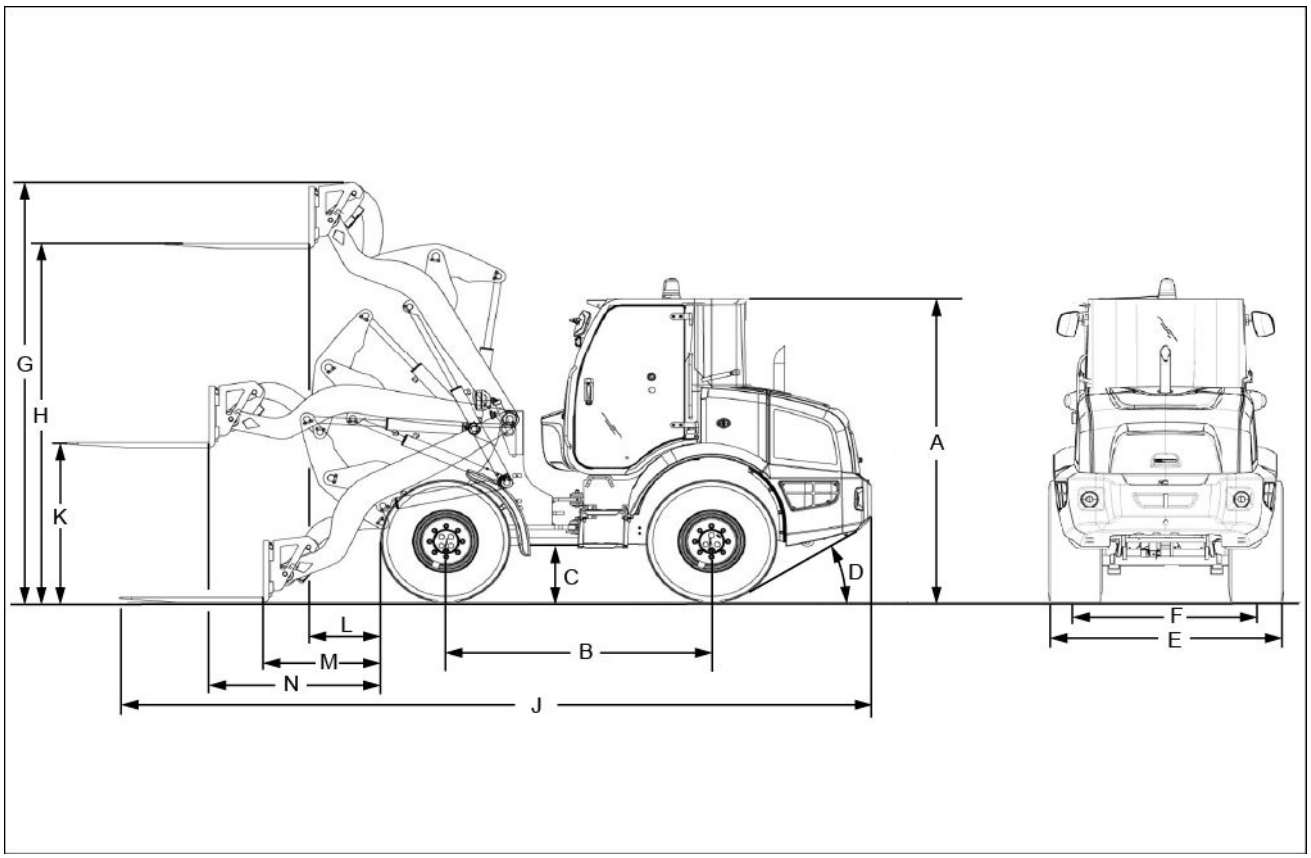
	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**0.7 m³** (**0.92 yd³**)	**0.7 m³** (**0.92 yd³**)	**0.7 m³** (**0.92 yd³**)
Heaped	**0.9 m³** (**1.18 yd³**)	**0.9 m³** (**1.18 yd³**)	**0.9 m³** (**1.18 yd³**)
Bucket width (maximum outer)	**2050 mm** (**80.7 in**)	**2050 mm** (**80.7 in**)	**2050 mm** (**80.7 in**)
Dimensional Outline Specifications			
A (top of cab height)	**2627 mm** (**103.4 in**)	**2627 mm** (**103.4 in**)	**2627 mm** (**103.4 in**)
B (wheelbase)	**2225 mm** (**87.6 in**)	**2225 mm** (**87.6 in**)	**2225 mm** (**87.6 in**)
C (ground clearance to cardan shaft)	**440 mm** (**17.3 in**)	**440 mm** (**17.3 in**)	**440 mm** (**17.3 in**)
D (rear angle of departure)	**27°**	**27°**	**27°**
E (overall width w/o bucket)	**1860 mm** (**73.2 in**)	**1860 mm** (**73.2 in**)	**1860 mm** (**73.2 in**)
F (tread width)	**1500 mm** (**59.1 in**)	**1500 mm** (**59.1 in**)	**1500 mm** (**59.1 in**)
G (overall height spillguard)	**4327 mm** (**170.4 in**)	**4327 mm** (**170.4 in**)	**4327 mm** (**170.4 in**)
H (hinge pin - fully raised)	**3290 mm** (**129.5 in**)	**3290 mm** (**129.5 in**)	**3290 mm** (**129.5 in**)
J (overall - bucket level on ground)	**5748 mm** (**226.3 in**)	**5800 mm** (**228.3 in**)	**5869 mm** (**231.1 in**)
K (dump - fully raised, **45°** dump)	**2511 mm** (**98.9 in**)	**2474 mm** (**97.4 in**)	**2425 mm** (**95.5 in**)
L (reach - fully raised, **45°** dump)	**935 mm** (**36.8 in**)	**971 mm** (**38.2 in**)	**1020 mm** (**40.2 in**)
M (reach - **2.13 m** (**7.0 ft**), **45°** dump)	**1291 mm** (**50.8 in**)	**1299 mm** (**51.1 in**)	**1309 mm** (**51.5 in**)
N (dig depth)	**98 mm** (**3.9 in**)	**98 mm** (**3.9 in**)	**98 mm** (**3.9 in**)
ISO Load Specifications			
Operating load	**1845 kg** (**4068 lb**)	**1791 kg** (**3948 lb**)	**1818 kg** (**4008 lb**)
Tipping load – machine straight	**4223 kg** (**9310 lb**)	**4169 kg** (**9191 lb**)	**4227 kg** (**9319 lb**)
Tipping load – 40° turn	**3690 kg** (**8135 lb**)	**3582 kg** (**7897 lb**)	**3635 kg** (**8014 lb**)

221F Z-bar Specifications - 1.2 m³ (1.6 yd³) LM Bucket on SSL Quick Coupler (rear standard counterweight)

	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**1.0 m³** (**1.31 yd³**)	**1.0 m³** (**1.31 yd³**)	**1.0 m³** (**1.31 yd³**)
Heaped	**1.2 m³** (**1.57 yd³**)	**1.2 m³** (**1.57 yd³**)	**1.2 m³** (**1.57 yd³**)
Bucket width (maximum outer)	**2100 mm** (**82.7 in**)	**2100 mm** (**82.7 in**)	**2100 mm** (**82.7 in**)
Dimensional Outline Specifications			
A (top of cab height)	**2627 mm** (**103.4 in**)	**2627 mm** (**103.4 in**)	**2627 mm** (**103.4 in**)
B (wheelbase)	**2225 mm** (**87.6 in**)	**2225 mm** (**87.6 in**)	**2225 mm** (**87.6 in**)
C (ground clearance to cardan shaft)	**440 mm** (**17.3 in**)	**440 mm** (**17.3 in**)	**440 mm** (**17.3 in**)
D (rear angle of departure)	**27°**	**27°**	**27°**
E (overall width w/o bucket)	**1860 mm** (**73.2 in**)	**1860 mm** (**73.2 in**)	**1860 mm** (**73.2 in**)
F (tread width)	**1500 mm** (**59.1 in**)	**1500 mm** (**59.1 in**)	**1500 mm** (**59.1 in**)
G (overall height spillguard)	**4470 mm** (**176.0 in**)	**4470 mm** (**176.0 in**)	**4470 mm** (**176.0 in**)
H (hinge pin - fully raised)	**3290 mm** (**129.5 in**)	**3290 mm** (**129.5 in**)	**3290 mm** (**129.5 in**)
J (overall - bucket level on ground)	**5843 mm** (**230.0 in**)	**5895 mm** (**232.1 in**)	**5964 mm** (**234.8 in**)
K (dump - fully raised, **45°** dump)	**2443 mm** (**96.2 in**)	**2407 mm** (**94.8 in**)	**2358 mm** (**92.8 in**)
L (reach - fully raised, **45°** dump)	**1002 mm** (**39.4 in**)	**1038 mm** (**40.9 in**)	**1087 mm** (**42.8 in**)
M (reach - **2.13 m** (**7.0 ft**), **45°** dump)	**1305 mm** (**51.4 in**)	**1312 mm** (**51.7 in**)	**1318 mm** (**51.9 in**)
N (dig depth)	**98 mm** (**3.9 in**)	**99 mm** (**3.9 in**)	**98 mm** (**3.9 in**)
ISO Load Specifications			
Operating load	**1793 kg** (**3953 lb**)	**1791 kg** (**3948 lb**)	**1807 kg** (**3984 lb**)
Tipping load – machine straight	**4173 kg** (**9200 lb**)	**4168 kg** (**9189 lb**)	**4212 kg** (**9286 lb**)
Tipping load – 40° turn	**3586 kg** (**7906 lb**)	**3582 kg** (**7897 lb**)	**3614 kg** (**7968 lb**)

221F Z-bar Specifications - 0.9 m³ (1.2 yd³) MP (4x1) Bucket on SSL Quick Coupler (rear standard counterweight)

	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**0.7 m³** (**0.92 yd³**)	**0.7 m³** (**0.92 yd³**)	**0.7 m³** (**0.92 yd³**)
Heaped	**0.9 m³** (**1.2 yd³**)	**0.9 m³** (**1.2 yd³**)	**0.9 m³** (**1.2 yd³**)
Bucket width (maximum outer)	**2050 mm** (**80.7 in**)	**2050 mm** (**80.7 in**)	**2050 mm** (**80.7 in**)
Dimensional Outline Specifications			
A (top of cab height)	**2627 mm** (**103.4 in**)	**2627 mm** (**103.4 in**)	**2627 mm** (**103.4 in**)
B (wheelbase)	**2225 mm** (**87.6 in**)	**2225 mm** (**87.6 in**)	**2225 mm** (**87.6 in**)
C (ground clearance to cardan shaft)	**440 mm** (**17.3 in**)	**440 mm** (**17.3 in**)	**440 mm** (**17.3 in**)
D (rear angle of departure)	**27°**	**27°**	**27°**
E (overall width w/o bucket)	**1860 mm** (**73.2 in**)	**1860 mm** (**73.2 in**)	**1860 mm** (**73.2 in**)
F (tread width)	**1500 mm** (**59.1 in**)	**1500 mm** (**59.1 in**)	**1500 mm** (**59.1 in**)
G (overall height spillguard)	**4326 mm** (**170.3 in**)	**4326 mm** (**170.3 in**)	**4326 mm** (**170.3 in**)
H (hinge pin - fully raised)	**3289 mm** (**129.5 in**)	**3289 mm** (**129.5 in**)	**3289 mm** (**129.5 in**)
J (overall - bucket level on ground)	**5815 mm** (**228.9 in**)	**5866 mm** (**230.9 in**)	**5936 mm** (**233.7 in**)
K (dump - fully raised, **45°** dump)	**2463 mm** (**97.0 in**)	**2426 mm** (**95.5 in**)	**2377 mm** (**93.6 in**)
L (reach - fully raised, **45°** dump)	**981 mm** (**38.6 in**)	**1017 mm** (**40.0 in**)	**1066 mm** (**42.0 in**)
M (reach - **2.13 m** (**7.0 ft**), **45°** dump)	**1300 mm** (**51.2 in**)	**1307 mm** (**51.5 in**)	**1314 mm** (**51.7 in**)
N (dig depth)	**98 mm** (**3.9 in**)	**99 mm** (**3.9 in**)	**98 mm** (**3.9 in**)
ISO Load Specifications			
Operating load	**1654 kg** (**3646 lb**)	**1625 kg** (**3583 lb**)	**1692 kg** (**3730 lb**)
Tipping load – machine straight	**3992 kg** (**8801 lb**)	**3941 kg** (**8688 lb**)	**3979 kg** (**8772 lb**)
Tipping load – 40° turn	**3309 kg** (**7295 lb**)	**3249 kg** (**7163 lb**)	**3287 kg** (**7247 lb**)



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221F Z-bar Specifications - Standard forks (rear standard counterweight)

	HP Quick Coupler	SSL Quick Coupler
Forks Specifications		
Fork length	**1200 mm** (**47.2 in**)	**1200 mm** (**47.2 in**)
Fork maximum width (outside to outside of tine)	**956 mm** (**37.6 in**)	**956 mm** (**37.6 in**)
Dimensional Outline Specifications		
A (top of cab height)	**2627 mm** (**103.4 in**)	**2627 mm** (**103.4 in**)
B (wheelbase)	**2225 mm** (**87.6 in**)	**2225 mm** (**87.6 in**)
C (ground clearance to cardan shaft)	**440 mm** (**17.3 in**)	**440 mm** (**17.3 in**)
D (rear angle of departure)	**27°**	**27°**
E (overall width w/o bucket)	**1860 mm** (**73.2 in**)	**1860 mm** (**73.2 in**)
F (tread width)	**1500 mm** (**59.1 in**)	**1500 mm** (**59.1 in**)
G (overall height – operating top of attachment)	**3626 mm** (**142.8 in**)	**3793 mm** (**149.3 in**)
H (ground clearance to top of tine – fully raised)	**3080 mm** (**121.3 in**)	**3134 mm** (**123.4 in**)
J (overall - forks level on ground)	**6233 mm** (**245.4 in**)	**6406 mm** (**252.2 in**)
K (reach – ground clearance to top of tine)	**1341 mm** (**52.8 in**)	**1395 mm** (**54.9 in**)
L (reach - fully raised, vertical front surface of tine)	**616 mm** (**24.3 in**)	**789 mm** (**31.1 in**)
M (reach – ground to vertical front surface of tine)	**987 mm** (**38.9 in**)	**1119 mm** (**44.1 in**)
N (maximum reach – vertical front surface of tine)	**1425 mm** (**56.1 in**)	**1598 mm** (**62.9 in**)
Load Specifications (EN 474–3)		
Operating load		
Rough terrain	**1687 kg** (**3719 lb**)	**1701 kg** (**3750 lb**)
Firm and level ground	**2249 kg** (**4958 lb**)	**2269 kg** (**5002 lb**)
ISO Load Specifications		
Tipping load		
Machine straight	**3168 kg** (**6984 lb**)	**3129 kg** (**6898 lb**)
40° turn	**2811 kg** (**6197 lb**)	**2836 kg** (**6252 lb**)

Machine specifications and dimensions – 321F General specifications

The following specifications are common to all 321F model configurations equipped with standard tire (365/80 R20 tires)

321F common to all buckets specifications

Feature	Specification
Overall height (top of exhaust)	**2283 mm** (**89.9 in**)
Turning radius (outside of tires)	**3987 mm** (**157.0 in**)
Turning angle from center	**40°**
Total turning angle	**80°**
Rear axle oscillation total	**20°**
Height to lower drawbar	**832 mm** (**32.8 in**)
Vertical wheel travel (trunnion fully oscillated)	**300 mm** (**11.8 in**)
Hinge pin height (carry position)	**414 mm** (**16.3 in**)

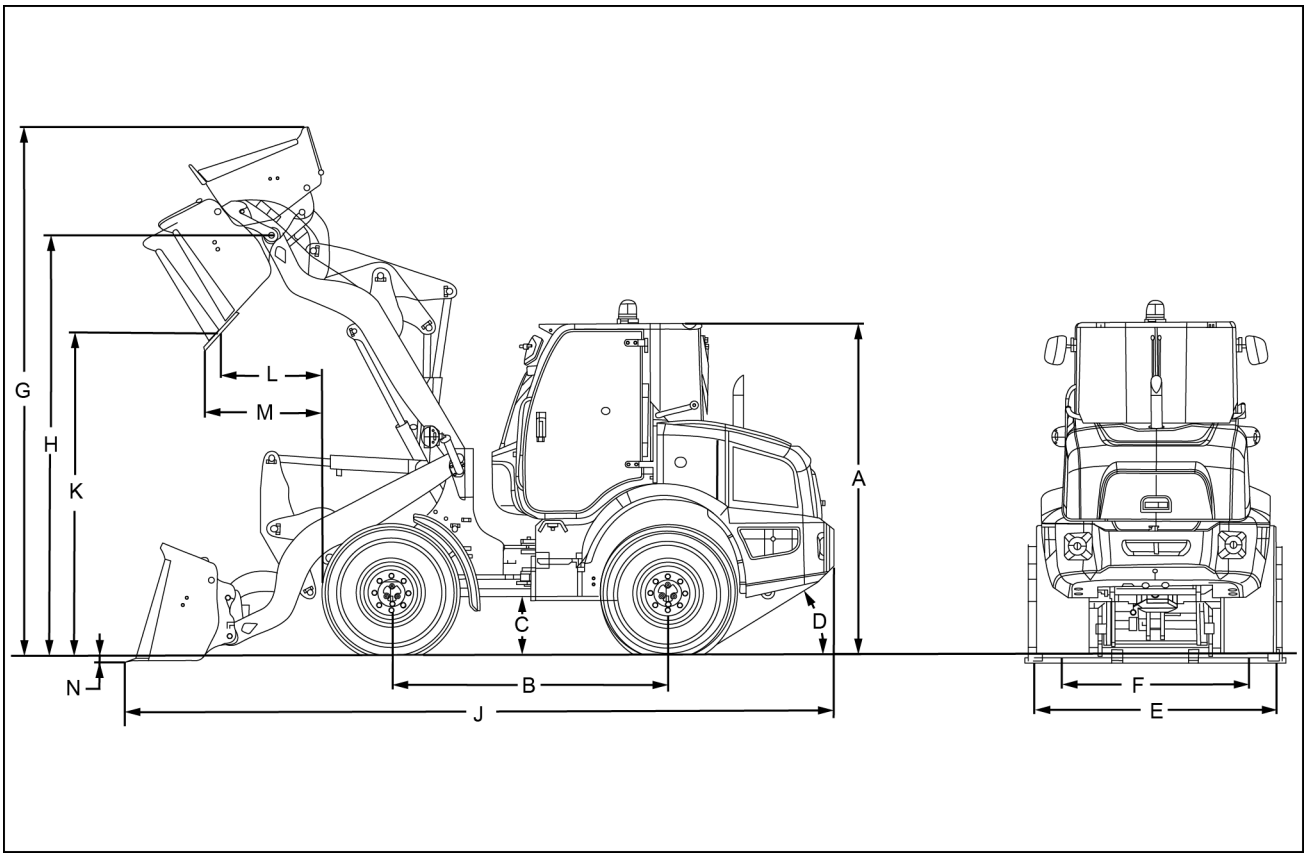
Implement cycle time	321F
Raising time – Loaded	**5.8 s**
Lowering time – Empty power down	**3.8 s**
Dump time – Loaded	**1.7 s**

Glossary

A table of the acronyms used in this section, is reported.

Bucket acronyms	
Acronym	Definition
GP	General Purpose
LM	Light Material
MP (4x1)	Multi Purpose (4x1)
Quick Coupler acronyms	
Acronym	Definition
HP	Horizontal Pin
SSL	Skid Steer Loader

321F Loader - Lift Arm Specifications



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321F Z-bar Specifications - 1.0 m³ (1.3 yd³) GP Bucket on HP Quick Coupler (rear standard counterweight)

	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**0.8 m³** (**1.05 yd³**)	**0.8 m³** (**1.05 yd³**)	**0.8 m³** (**1.05 yd³**)
Heaped	**1.0 m³** (**1.31 yd³**)	**1.0 m³** (**1.31 yd³**)	**1.0 m³** (**1.31 yd³**)
Bucket width (maximum outer)	**2100 mm** (**82.7 in**)	**2100 mm** (**82.7 in**)	**2100 mm** (**82.7 in**)
Dimensional Outline Specifications			
A (top of cab height)	**2680 mm** (**105.5 in**)	**2680 mm** (**105.5 in**)	**2680 mm** (**105.5 in**)
B (wheelbase)	**2225 mm** (**87.6 in**)	**2225 mm** (**87.6 in**)	**2225 mm** (**87.6 in**)
C (ground clearance to cardan shaft)	**493 mm** (**19.4 in**)	**493 mm** (**19.4 in**)	**493 mm** (**19.4 in**)
D (rear angle of departure)	**32°**	**32°**	**32°**
E (overall width w/o bucket)	**1860 mm** (**73.2 in**)	**1860 mm** (**73.2 in**)	**1860 mm** (**73.2 in**)
F (tread width)	**1500 mm** (**59.1 in**)	**1500 mm** (**59.1 in**)	**1500 mm** (**59.1 in**)
G (overall height spillguard)	**4322 mm** (**170.2 in**)	**4322 mm** (**170.2 in**)	**4322 mm** (**170.2 in**)
H (hinge pin - fully raised)	**3395 mm** (**133.7 in**)	**3395 mm** (**133.7 in**)	**3395 mm** (**133.7 in**)
J (overall - bucket level on ground)	**5684 mm** (**223.8 in**)	**5735 mm** (**225.8 in**)	**5805 mm** (**228.5 in**)
K (dump - fully raised, **45°** dump)	**2687 mm** (**105.8 in**)	**2651 mm** (**104.4 in**)	**2601 mm** (**102.4 in**)
L (reach - fully raised, **45°** dump)	**845 mm** (**33.3 in**)	**880 mm** (**34.6 in**)	**930 mm** (**36.6 in**)
M (reach - **2.13 m** (**7.0 ft**), **45°** dump)	**1323 mm** (**52.1 in**)	**1336 mm** (**52.6 in**)	**1353 mm** (**53.3 in**)
N (dig depth)	**84 mm** (**3.3 in**)	**84 mm** (**3.3 in**)	**84 mm** (**3.3 in**)
ISO Load Specifications			
Operating load	**1962 kg** (**4325 lb**)	**1924 kg** (**4242 lb**)	**1939 kg** (**4275 lb**)
Tipping load – machine straight	**4625 kg** (**10196 lb**)	**4569 kg** (**10073 lb**)	**4599 kg** (**10139 lb**)
Tipping load – 40° turn	**3924 kg** (**8651 lb**)	**3849 kg** (**8486 lb**)	**3878 kg** (**8550 lb**)

321F Z-bar Specifications - 1.3 m³ (1.7 yd³) LM Bucket on HP Quick Coupler (rear standard counterweight)

	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**1.1 m³ (1.44 yd³)**	**1.1 m³ (1.44 yd³)**	**1.1 m³ (1.44 yd³)**
Heaped	**1.3 m³ (1.7 yd³)**	**1.3 m³ (1.7 yd³)**	**1.3 m³ (1.7 yd³)**
Bucket width (maximum outer)	**2100 mm (82.7 in)**	**2100 mm (82.7 in)**	**2100 mm (82.7 in)**
Dimensional Outline Specifications			
A (top of cab height)	**2680 mm (105.5 in)**	**2680 mm (105.5 in)**	**2680 mm (105.5 in)**
B (wheelbase)	**2225 mm (87.6 in)**	**2225 mm (87.6 in)**	**2225 mm (87.6 in)**
C (ground clearance to cardan shaft)	**493 mm (19.4 in)**	**493 mm (19.4 in)**	**493 mm (19.4 in)**
D (rear angle of departure)	**32°**	**32°**	**32°**
E (overall width w/o bucket)	**1860 mm (73.2 in)**	**1860 mm (73.2 in)**	**1860 mm (73.2 in)**
F (tread width)	**1500 mm (59.1 in)**	**1500 mm (59.1 in)**	**1500 mm (59.1 in)**
G (overall height spillguard)	**4447 mm (175.1 in)**	**4447 mm (175.1 in)**	**4447 mm (175.1 in)**
H (hinge pin - fully raised)	**3395 mm (133.7 in)**	**3395 mm (133.7 in)**	**3395 mm (133.7 in)**
J (overall - bucket level on ground)	**5799 mm (228.3 in)**	**5851 mm (230.4 in)**	**5920 mm (233.1 in)**
K (dump - fully raised, **45°** dump)	**2605 mm (102.6 in)**	**2569 mm (101.1 in)**	**2520 mm (99.2 in)**
L (reach - fully raised, **45°** dump)	**1352 mm (53.2 in)**	**962 mm (37.9 in)**	**1011 mm (39.8 in)**
M (reach - **2.13 m (7.0 ft)**, **45°** dump)	**1352 mm (53.2 in)**	**1363 mm (53.7 in)**	**1376 mm (54.2 in)**
N (dig depth)	**84 mm (3.3 in)**	**84 mm (3.3 in)**	**84 mm (3.3 in)**
ISO Load Specifications			
Operating load	**1951 kg (4301 lb)**	**1923 kg (4239 lb)**	**1941 kg (4279 lb)**
Tipping load – machine straight	**4609 kg (10161 lb)**	**4568 kg (10071 lb)**	**4594 kg (10128 lb)**
Tipping load – 40° turn	**3903 kg (8605 lb)**	**3845 kg (8477 lb)**	**3882 kg (8558 lb)**

321F Z-bar Specifications - 1.0 m³ (1.3 yd³) MP (4x1) Bucket on HP Quick Coupler (rear standard counterweight)

	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**0.8 m³ (1.05 yd³)**	**0.8 m³ (1.05 yd³)**	**0.8 m³ (1.05 yd³)**
Heaped	**1.0 m³ (1.3 yd³)**	**1.0 m³ (1.3 yd³)**	**1.0 m³ (1.3 yd³)**
Bucket width (maximum outer)	**2100 mm (82.7 in)**	**2100 mm (82.7 in)**	**2100 mm (82.7 in)**
Dimensional Outline Specifications			
A (top of cab height)	**2680 mm (105.5 in)**	**2680 mm (105.5 in)**	**2680 mm (105.5 in)**
B (wheelbase)	**2225 mm (87.6 in)**	**2225 mm (87.6 in)**	**2225 mm (87.6 in)**
C (ground clearance to cardan shaft)	**493 mm (19.4 in)**	**493 mm (19.4 in)**	**493 mm (19.4 in)**
D (rear angle of departure)	**32°**	**32°**	**32°**
E (overall width w/o bucket)	**1860 mm (73.2 in)**	**1860 mm (73.2 in)**	**1860 mm (73.2 in)**
F (tread width)	**1500 mm (59.1 in)**	**1500 mm (59.1 in)**	**1500 mm (59.1 in)**
G (overall height spillguard)	**4380 mm (172.4 in)**	**4380 mm (172.4 in)**	**4380 mm (172.4 in)**
H (hinge pin - fully raised)	**3395 mm (133.7 in)**	**3395 mm (133.7 in)**	**3395 mm (133.7 in)**
J (overall - bucket level on ground)	**5778 mm (227.5 in)**	**5830 mm (229.5 in)**	**5899 mm (232.2 in)**
K (dump - fully raised, **45°** dump)	**2620 mm (103.1 in)**	**2583 mm (101.7 in)**	**2534 mm (99.8 in)**
L (reach - fully raised, **45°** dump)	**911 mm (35.9 in)**	**947 mm (37.3 in)**	**997 mm (39.3 in)**
M (reach - **2.13 m (7.0 ft)**, **45°** dump)	**1347 mm (53.0 in)**	**1358 mm (53.5 in)**	**1372 mm (54.0 in)**
N (dig depth)	**84 mm (3.3 in)**	**84 mm (3.3 in)**	**84 mm (3.3 in)**
ISO Load Specifications			
Operating load	**1858 kg (4096 lb)**	**1765 kg (3891 lb)**	**1783 kg (3931 lb)**
Tipping load – machine straight	**4361 kg (9614 lb)**	**4301 kg (9482 lb)**	**4334 kg (9555 lb)**
Tipping load – 40° turn	**3716 kg (8192 lb)**	**3529 kg (7780 lb)**	**3566 kg (7862 lb)**

321F Z-bar Specifications - 1.0 m³ (1.3 yd³) GP Bucket on SSL Quick Coupler (rear standard counterweight)

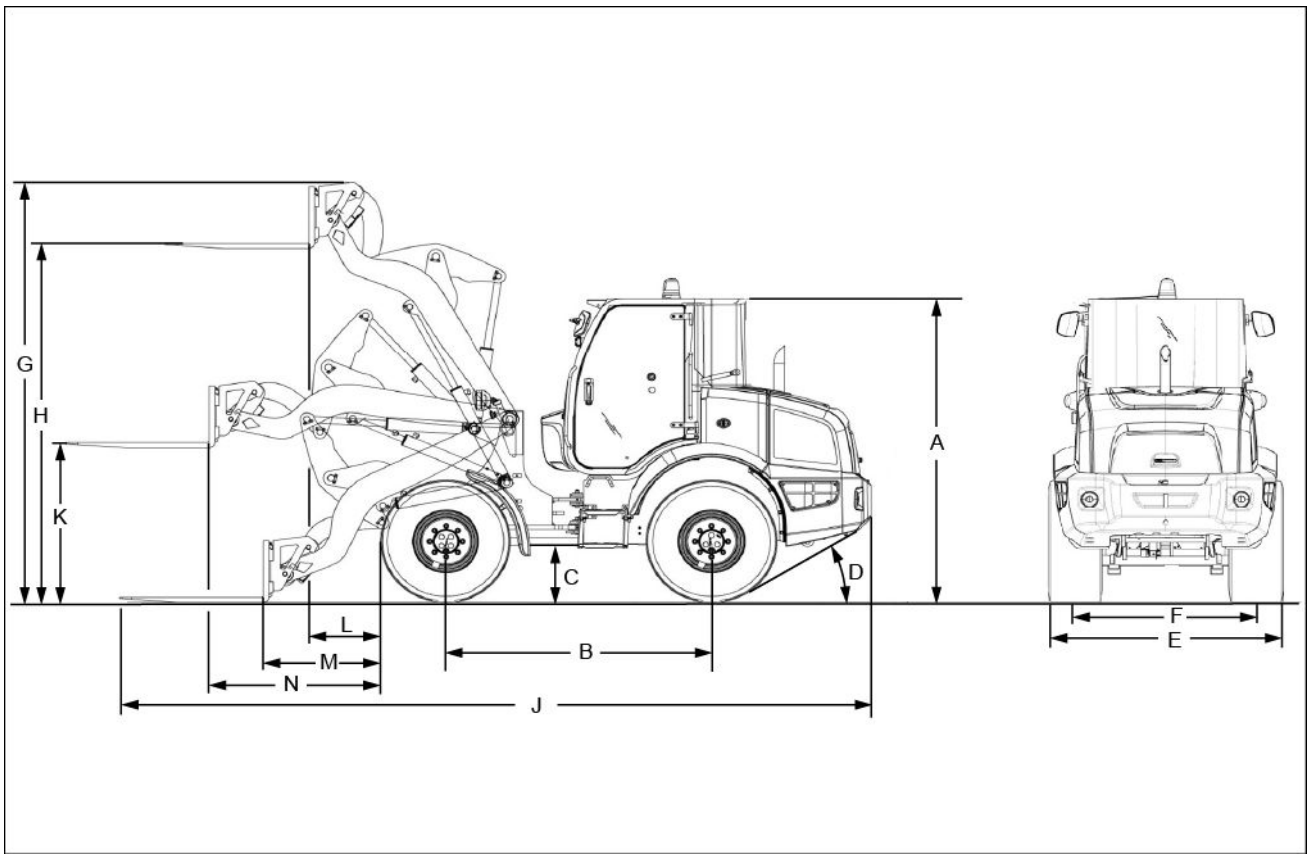
	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**0.8 m³ (1.05 yd³)**	**0.8 m³ (1.05 yd³)**	**0.8 m³ (1.05 yd³)**
Heaped	**1.0 m³ (1.31 yd³)**	**1.0 m³ (1.31 yd³)**	**1.0 m³ (1.31 yd³)**
Bucket width (maximum outer)	**2100 mm (82.7 in)**	**2100 mm (82.7 in)**	**2100 mm (82.7 in)**
Dimensional Outline Specifications			
A (top of cab height)	**2680 mm (105.5 in)**	**2680 mm (105.5 in)**	**2680 mm (105.5 in)**
B (wheelbase)	**2225 mm (87.6 in)**	**2225 mm (87.6 in)**	**2225 mm (87.6 in)**
C (ground clearance to cardan shaft)	**493 mm (19.4 in)**	**493 mm (19.4 in)**	**493 mm (19.4 in)**
D (rear angle of departure)	**32°**	**32°**	**32°**
E (overall width w/o bucket)	**1860 mm (73.2 in)**	**1860 mm (73.2 in)**	**1860 mm (73.2 in)**
F (tread width)	**1500 mm (59.1 in)**	**1500 mm (59.1 in)**	**1500 mm (59.1 in)**
G (overall height spillguard)	**4471 mm (176 in)**	**4471 mm (176 in)**	**4471 mm (176 in)**
H (hinge pin - fully raised)	**3395 mm (133.7 in)**	**3395 mm (133.7 in)**	**3395 mm (133.7 in)**
J (overall - bucket level on ground)	**5813 mm (228.9 in)**	**5878 mm (231.4 in)**	**5952 mm (234.3 in)**
K (dump - fully raised, **45°** dump)	**2596 mm (102.2 in)**	**2547 mm (100.3 in)**	**2493 mm (98.1 in)**
L (reach - fully raised, **45°** dump)	**935 mm (36.8 in)**	**959 mm (37.8 in)**	**1003 mm (39.5 in)**
M (reach - **2.13 m (7.0 ft)**, **45°** dump)	**1355 mm (53.3 in)**	**1344 mm (52.9 in)**	**1347 mm (53.0 in)**
N (dig depth)	**83 mm (3.3 in)**	**83 mm (3.3 in)**	**83 mm (3.3 in)**
ISO Load Specifications			
Operating load	**1881 kg (4147 lb)**	**1844 kg (4065 lb)**	**1858 kg (4096 lb)**
Tipping load – machine straight	**4446 kg (9802 lb)**	**4399 kg (9698 lb)**	**4418 kg (9740 lb)**
Tipping load – 40° turn	**3761 kg (8292 lb)**	**3687 kg (8128 lb)**	**3716 kg (8192 lb)**

321F Z-bar Specifications - 1.3 m³ (1.7 yd³) LM Bucket on SSL Quick Coupler (rear standard counterweight)

	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**1.1 m³ (1.44 yd³)**	**1.1 m³ (1.44 yd³)**	**1.1 m³ (1.44 yd³)**
Heaped	**1.3 m³ (1.7 yd³)**	**1.3 m³ (1.7 yd³)**	**1.3 m³ (1.7 yd³)**
Bucket width (maximum outer)	**2100 mm (82.7 in)**	**2100 mm (82.7 in)**	**2100 mm (82.7 in)**
Dimensional Outline Specifications			
A (top of cab height)	**2680 mm (105.5 in)**	**2680 mm (105.5 in)**	**2680 mm (105.5 in)**
B (wheelbase)	**2225 mm (87.6 in)**	**2225 mm (87.6 in)**	**2225 mm (87.6 in)**
C (ground clearance to cardan shaft)	**493 mm (19.4 in)**	**493 mm (19.4 in)**	**493 mm (19.4 in)**
D (rear angle of departure)	**32°**	**32°**	**32°**
E (overall width w/o bucket)	**1860 mm (73.2 in)**	**1860 mm (73.2 in)**	**1860 mm (73.2 in)**
F (tread width)	**1500 mm (59.1 in)**	**1500 mm (59.1 in)**	**1500 mm (59.1 in)**
G (overall height spillguard)	**4626 mm (182.1 in)**	**4626 mm (182.1 in)**	**4626 mm (182.1 in)**
H (hinge pin - fully raised)	**3395 mm (133.7 in)**	**3395 mm (133.7 in)**	**3395 mm (133.7 in)**
J (overall - bucket level on ground)	**5915 mm (232.9 in)**	**5966 mm (234.9 in)**	**6036 mm (237.6 in)**
K (dump - fully raised, **45°** dump)	**2524 mm (99.4 in)**	**2487 mm (97.9 in)**	**2438 mm (96.0 in)**
L (reach - fully raised, **45°** dump)	**1010 mm (39.8 in)**	**1046 mm (41.2 in)**	**1095 mm (43.1 in)**
M (reach - **2.13 m (7.0 ft)**, **45°** dump)	**1377 mm (54.2 in)**	**1386 mm (54.6 in)**	**1396 mm (55.0 in)**
N (dig depth)	**83 mm (3.2 in)**	**83 mm (3.2 in)**	**83 mm (3.2 in)**
ISO Load Specifications			
Operating load	**1893 kg (4173 lb)**	**1865 kg (4112 lb)**	**1880 kg (4145 lb)**
Tipping load – machine straight	**4580 kg (10097 lb)**	**4460 kg (9833 lb)**	**4480 kg (9877 lb)**
Tipping load – 40° turn	**3786 kg (8347 lb)**	**3729 kg (8221 lb)**	**3760 kg (8289 lb)**

321F Z-bar Specifications - 1.0 m³ (1.3 yd³) MP (4x1) Bucket on SSL Quick Coupler (rear standard counterweight)

	Naked bucket	Bucket w/cutting edge	Bucket w/bolt on edge
ISO Bucket Specifications			
Struck	**0.8 m³ (1.05 yd³)**	**0.8 m³ (1.05 yd³)**	**0.8 m³ (1.05 yd³)**
Heaped	**1.0 m³ (1.3 yd³)**	**1.0 m³ (1.3 yd³)**	**1.0 m³ (1.3 yd³)**
Bucket width (maximum outer)	**2100 mm (82.7 in)**	**2100 mm (82.7 in)**	**2100 mm (82.7 in)**
Dimensional Outline Specifications			
A (top of cab height)	**2680 mm (105.5 in)**	**2680 mm (105.5 in)**	**2680 mm (105.5 in)**
B (wheelbase)	**2225 mm (87.6 in)**	**2225 mm (87.6 in)**	**2225 mm (87.6 in)**
C (ground clearance to cardan shaft)	**493 mm (19.4 in)**	**493 mm (19.4 in)**	**493 mm (19.4 in)**
D (rear angle of departure)	**32°**	**32°**	**32°**
E (overall width w/o bucket)	**1860 mm (73.2 in)**	**1860 mm (73.2 in)**	**1860 mm (73.2 in)**
F (tread width)	**1500 mm (59.1 in)**	**1500 mm (59.1 in)**	**1500 mm (59.1 in)**
G (overall height spillguard)	**4431 mm (174.4 in)**	**4431 mm (174.4 in)**	**4431 mm (174.4 in)**
H (hinge pin - fully raised)	**3395 mm (133.7 in)**	**3395 mm (133.7 in)**	**3395 mm (133.7 in)**
J (overall - bucket level on ground)	**5851 mm (230.4 in)**	**5903 mm (232.4 in)**	**5973 mm (235.2 in)**
K (dump - fully raised, **45°** dump)	**2568 mm (101.1 in)**	**2531 mm (99.6 in)**	**2483 mm (97.8 in)**
L (reach - fully raised, **45°** dump)	**964 mm (38.0 in)**	**1000 mm (39.4 in)**	**1049 mm (41.3 in)**
M (reach - **2.13 m (7.0 ft)**, **45°** dump)	**1364 mm (53.7 in)**	**1374 mm (54.1 in)**	**1049 mm (41.3 in)**
N (dig depth)	**83 mm (3.3 in)**	**83 mm (3.3 in)**	**83 mm (3.3 in)**
ISO Load Specifications			
Operating load	**1727 kg (3807 lb)**	**1703 kg (3754 lb)**	**1717 kg (3785 lb)**
Tipping load – machine straight	**4184 kg (9224 lb)**	**4145 kg (9138 lb)**	**4173 kg (9200 lb)**
Tipping load – 40° turn	**3454 kg (7615 lb)**	**3407 kg (7511 lb)**	**3434 kg (7571 lb)**



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321F Z-bar Specifications - Standard forks (rear standard counterweight)

	HP Quick Coupler	SSL Quick Coupler
Forks Specifications		
Fork length	**1200 mm** (**47.2 in**)	**1200 mm** (**47.2 in**)
Fork maximum width (outside to outside of tine)	**956 mm** (**37.6 in**)	**956 mm** (**37.6 in**)
Dimensional Outline Specifications		
A (top of cab height)	**2680 mm** (**105.5 in**)	**2680 mm** (**105.5 in**)
B (wheelbase)	**2225 mm** (**87.6 in**)	**2225 mm** (**87.6 in**)
C (ground clearance to cardan shaft)	**493 mm** (**19.4 in**)	**493 mm** (**19.4 in**)
D (rear angle of departure)	**32°**	**32°**
E (overall width w/o bucket)	**1860 mm** (**73.2 in**)	**1860 mm** (**73.2 in**)
F (tread width)	**1500 mm** (**59.1 in**)	**1500 mm** (**59.1 in**)
G (overall height – operating top of attachment)	**3731 mm** (**146.9 in**)	**3898 mm** (**153.5 in**)
H (ground clearance to top of tine – fully raised)	**3185 mm** (**125.4 in**)	**3239 mm** (**127.5 in**)
J (overall - forks level on ground)	**6270 mm** (**246.9 in**)	**6324 mm** (**249.0 in**)
K (reach – ground clearance to top of tine)	**1398 mm** (**55.0 in**)	**1452 mm** (**57.2 in**)
L (reach - fully raised, vertical front surface of tine)	**599 mm** (**23.6 in**)	**772 mm** (**30.4 in**)
M (reach – ground to vertical front surface of tine)	**966 mm** (**38.0 in**)	**1097 mm** (**43.2 in**)
N (maximum reach – vertical front surface of tine)	**1430 mm** (**56.3 in**)	**1603 mm** (**63.1 in**)
Load Specifications (EN 474–3)		
Operating load		
Rough terrain	**1837 kg** (**4050 lb**)	**1700 kg** (**3748 lb**)
Firm and level ground	**2449 kg** (**5399 lb**)	**2267 kg** (**4998 lb**)
ISO Load Specifications		
Tipping load		
Machine straight	**3616 kg** (**7972 lb**)	**3344 kg** (**7372 lb**)
40° turn	**3061 kg** (**6748 lb**)	**2834 kg** (**6248 lb**)

Tires

The tables are for guidance only. For exact information regarding inflation pressures and loads for your particular tires, consult an authorized dealer.

Listed pressures refer to inflation for use on site.

NOTICE: *do not fill the tires with liquid. Do not ballast or foam under any circumstances.*

21F tire type	Front pressure	Rear pressure
12.5-18	**3.5 bar** (**50.7 psi**)	**3.5 bar** (**50.7 psi**)
335/80 R18	**3.5 bar** (**50.7 psi**)	**3.5 bar** (**50.7 psi**)
365/70 R18	**3.5 bar** (**50.7 psi**)	**3.5 bar** (**50.7 psi**)
12.5-20	**3.5 bar** (**50.7 psi**)	**3.5 bar** (**50.7 psi**)
340/80 R18**	**3.5 bar** (**50.7 psi**)	**3.5 bar** (**50.7 psi**)

121F tire type	Front pressure	Rear pressure
12.5-18	**3.5 bar** (**50.7 psi**)	**3.5 bar** (**50.7 psi**)
335/80 R18	**3.5 bar** (**50.7 psi**)	**3.5 bar** (**50.7 psi**)
365/70 R18	**3.5 bar** (**50.7 psi**)	**3.5 bar** (**50.7 psi**)
12.5-20	**3.5 bar** (**50.7 psi**)	**3.5 bar** (**50.7 psi**)
340/80 R18**	**3.5 bar** (**50.7 psi**)	**3.5 bar** (**50.7 psi**)

221F tire type	Front pressure	Rear pressure
365/70 R18	**3.5 bar** (**50.7 psi**)	**3.5 bar** (**50.7 psi**)
12.5-20	**3.5 bar** (**50.7 psi**)	**3.5 bar** (**50.7 psi**)
14.5-40	**3.5 bar** (**50.7 psi**)	**3.5 bar** (**50.7 psi**)
360/80 R20*	**3.2 bar** (**46.4 psi**)	**3.2 bar** (**46.4 psi**)
365/80 R20	**3.5 bar** (**50.7 psi**)	**3.5 bar** (**50.7 psi**)
405/70 R20	**3.5 bar** (**50.7 psi**)	**3.5 bar** (**50.7 psi**)
400/70 R20**	**3.5 bar** (**50.7 psi**)	**3.5 bar** (**50.7 psi**)

321F tire type	Front pressure	Rear pressure
14.5-40	**3.5 bar** (**50.7 psi**)	**3.5 bar** (**50.7 psi**)
360/80 R20*	**3.2 bar** (**46.4 psi**)	**3.2 bar** (**46.4 psi**)
365/80 R20	**3.5 bar** (**50.7 psi**)	**3.5 bar** (**50.7 psi**)
405/70 R20	**3.5 bar** (**50.7 psi**)	**3.5 bar** (**50.7 psi**)
400/70 R20**	**3.5 bar** (**50.7 psi**)	**3.5 bar** (**50.7 psi**)

* snow tires
** Agriculture tires

9 - ACCESSORIES

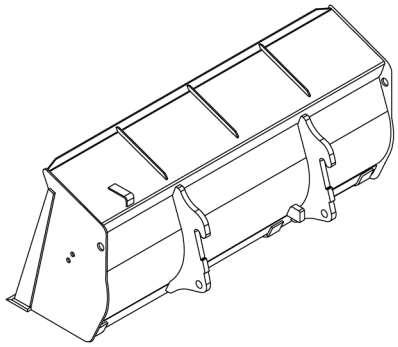
Attachments

Only attachments recommended and approved by CNH Industrial are to be used on our machines. Technical specifications of attachments and machinery interfaces are listed in the following tables. The manufacturer's liability will be denied in case of modification or of attachment adaptation carried out without his knowing it.

NOTE: *see "Driving on public roads and general transportation safety" – Chapter 2 in this manual for information about on-road regulations.*

General Purpose (GP) buckets

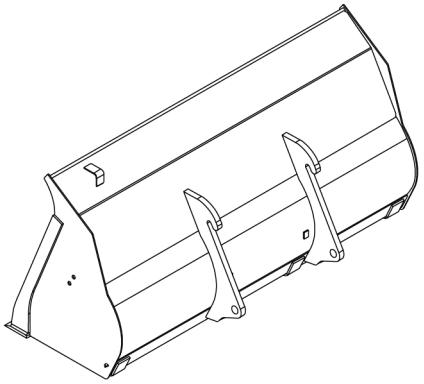
GENERAL PURPOSE BUCKET, HP QUICK COUPLER



LEIL15CWL0130AA 1

Type of bucket	Z-bar				XT		Property		
	21F	121F	221F	321F	21F XT	121F XT	Capacity heaped	Weight	Width
Bucket, **0.7 m³**x **1900 mm**	x						**0.7 m³** (**0.92 yd³**)	**251 kg** (**553 lb**)	**1900 mm** (**74.8 in**)
Bucket, **0.8 m³**x **2050 mm**	x	x					**0.8 m³** (**1.05 yd³**)	**269 kg** (**593 lb**)	**2050 mm** (**80.71 in**)
Bucket, **0.9 m³**x **2050 mm**		x	x				**0.9 m³** (**1.18 yd³**)	**285 kg** (**628 lb**)	**2050 mm** (**80.71 in**)
Bucket, **1.0 m³**x **2100 mm**			x	x			**1.0 m³** (**1.31 yd³**)	**302 kg** (**666 lb**)	**2100 mm** (**82.68 in**)

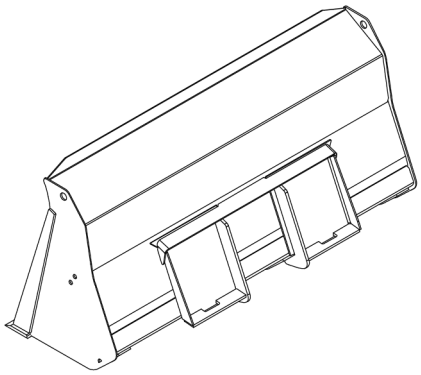
GENERAL PURPOSE BUCKET, HP QUICK COUPLER (XT)



LEIL15CWL0112AA 2

Type of bucket	Z-bar				XT		Property		
	21F	121F	221F	321F	21F XT	121F XT	Capacity heaped	Weight	Width
Bucket, **0.7 m³**x **1900 mm**					x	x	**0.7 m³** (**0.92 yd³**)	**269 kg** (**593 lb**)	**1900 mm** (**74.8 in**)
Bucket, **0.8 m³**x **2050 mm**					x	x	**0.8 m³** (**1.05 yd³**)	**290 kg** (**639 lb**)	**2050 mm** (**80.71 in**)

GENERAL PURPOSE BUCKET, SSL QUICK COUPLER

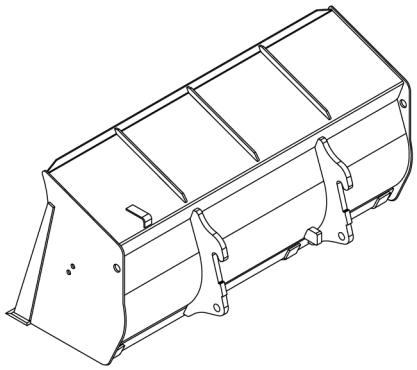


LEIL15CWL0113AA 3

Type of bucket	Z-bar				XT		Property		
	21F	121F	221F	321F	21F XT	121F XT	Capacity heaped	Weight	Width
Bucket, **0.7 m³**x **1900 mm**	x				x		**0.7 m³** (**0.92 yd³**)	**246 kg** (**542 lb**)	**1900 mm** (**74.80 in**)
Bucket, **0.8 m³**x **2050 mm**	x	x			x	x	**0.8 m³** (**1.05 yd³**)	**265 kg** (**584 lb**)	**2050 mm** (**80.71 in**)
Bucket, **0.9 m³**x **2050 mm**		x	x			x	**0.9 m³** (**1.18 yd³**)	**280 kg** (**617 lb**)	**2050 mm** (**80.71 in**)
Bucket, **1.0 m³**x **2100 mm**			x	x			**1.0 m³** (**1.31 yd³**)	**296 kg** (**653 lb**)	**2100 mm** (**82.68 in**)

Light Material (LM) buckets

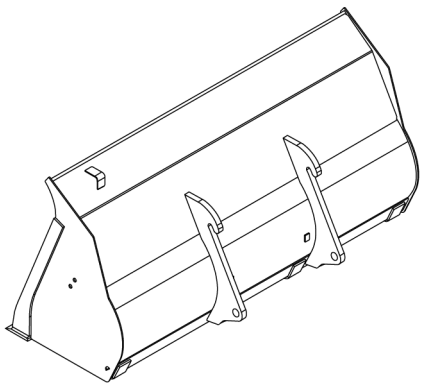
LIGHT MATERIAL BUCKET, HP QUICK COUPLER



LEIL15CWL0111AA 4

Type of bucket	Z-bar				XT		Property		
	21F	121F	221F	321F	21F XT	121F XT	Capacity heaped	Weight	Width
Bucket, **1.0 m³**x **2050 mm**	x						**1.0 m³** (**1.31 yd³**)	**295 kg** (**650 lb**)	**2050 mm** (**80.71 in**)
Bucket, **1.2 m³**x **2100 mm**			x				**1.2 m³** (**1.57 yd³**)	**326 kg** (**719 lb**)	**2100 mm** (**82.68 in**)
Bucket, **1.1 m³**x **2100 mm**		x		x			**1.1 m³** (**1.44 yd³**)	**310 kg** (**683 lb**)	**2100 mm** (**82.68 in**)
Bucket, **1.3 m³**x **2100 mm**				x			**1.3 m³** (**1.70 yd³**)	**339 kg** (**747 lb**)	**2100 mm** (**82.68 in**)

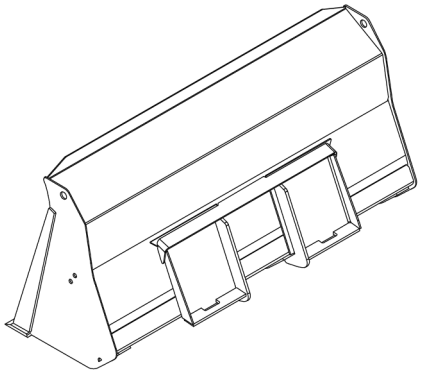
LIGHT MATERIAL BUCKET, HP QUICK COUPLER (XT)



LEIL15CWL0112AA 5

Type of bucket	Z-bar				XT		Property		
	21F	121F	221F	321F	21F XT	121F XT	Capacity heaped	Weight	Width
Bucket, **0.9 m³**x **2050 mm**						x	**0.9 m³** (**1.18 yd³**)	**307 kg** (**677 lb**)	**2050 mm** (**80.71 in**)
Bucket, **1.1 m³**x **2100 mm**						x	**1.1 m³** (**1.44 yd³**)	**342 kg** (**754 lb**)	**2100 mm** (**82.68 in**)

LIGHT MATERIAL BUCKET, SSL QUICK COUPLER

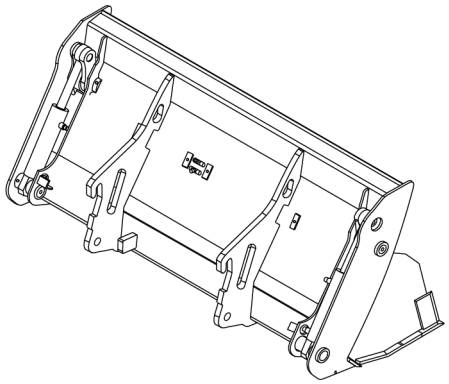


LEIL15CWL0113AA 6

Type of bucket	Z-bar				XT		Property		
	21F	121F	221F	321F	21F XT	121F XT	Capacity heaped	Weight	Width
Bucket, **1.0 m³**x **2050 mm**	x						**1.0 m³** (**1.31 yd³**)	**294 kg** (**648 lb**)	**2050 mm** (**80.71 in**)
Bucket, **1.1 m³**x **2100 mm**		x		x		x	**1.1 m³** (**1.44 yd³**)	**311 kg** (**686 lb**)	**2100 mm** (**82.68 in**)
Bucket, **1.2 m³**x **2100 mm**			x				**1.2 m³** (**1.57 yd³**)	**325 kg** (**717 lb**)	**2100 mm** (**82.68 in**)
Bucket, **1.3 m³**x **2100 mm**				x			**1.3 m³** (**1.70 yd³**)	**340 kg** (**750 lb**)	**2100 mm** (**82.68 in**)

Multi Purpuse (4x1) buckets

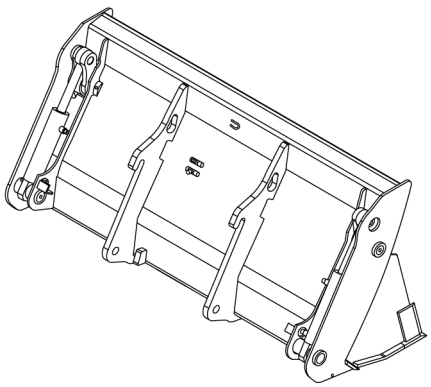
MP (4x1) BUCKET, HP QUICK COUPLER



LEIL15CWL0114AA 7

Type of bucket	Z-bar				XT		Property		
	21F	121F	221F	321F	21F XT	121F XT	Capacity heaped	Weight	Width
Bucket, **0.7 m³**x **1900 mm**	x						**0.7 m³** (**0.92 yd³**)	**550 kg** (**1213 lb**)	**1900 mm** (**74.80 in**)
Bucket, **0.8 m³**x **2050 mm**	x	x					**0.8 m³** (**1.05 yd³**)	**573 kg** (**1263 lb**)	**2050 mm** (**80.71 in**)
Bucket, **0.9 m³**x **2050 mm**		x	x				**0.9 m³** (**1.18 yd³**)	**610 kg** (**1345 lb**)	**2050 mm** (**80.71 in**)
Bucket, **1.0 m³**x **2100 mm**				x			**1.0 m³** (**1.31 yd³**)	**615 kg** (**1356 lb**)	**2100 mm** (**82.68 in**)

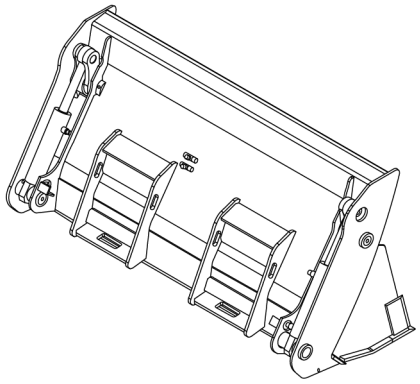
MP (4x1) BUCKET, HP QUICK COUPLER (XT)



LEIL15CWL0115AA 8

Type of bucket	Z-bar				XT		Property		
	21F	121F	221F	321F	21F XT	121F XT	Capacity heaped	Weight	Width
Bucket, **0.7 m³**x **1900 mm**					x		**0.7 m³** (**0.92 yd³**)	**533 kg** (**1175 lb**)	**1900 mm** (**74.80 in**)
Bucket, **0.8 m³**x **2050 mm**						x	**0.8 m³** (**1.05 yd³**)	**658 kg** (**1451 lb**)	**2050 mm** (**80.71 in**)

MP (4x1) BUCKET, SSL QUICK COUPLER

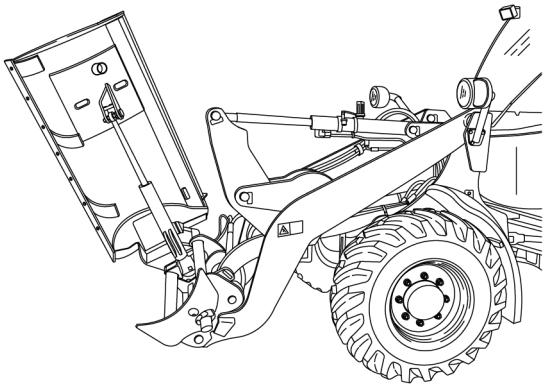


LEIL15CWL0116AA 9

Type of bucket	Z-bar				XT		Property		
	21F	121F	221F	321F	21F XT	121F XT	Capacity heaped	Weight	Width
Bucket, **0.7 m³**x **1900 mm**	x				x		**0.7 m³** (**0.92 yd³**)	**578 kg** (**1274 lb**)	**1900 mm** (**74.80 in**)
Bucket, **0.8 m³**x **2050 mm**		x				x	**0.8 m³** (**1.05 yd³**)	**602 kg** (**1327 lb**)	**2050 mm** (**80.71 in**)
Bucket, **0.9 m³**x **2050 mm**			x				**0.9 m³** (**1.18 yd³**)	**638 kg** (**1407 lb**)	**2050 mm** (**80.71 in**)
Bucket, **1.0 m³**x **2100 mm**				x			**1.0 m³** (**1.31 yd³**)	**647 kg** (**1426 lb**)	**2100 mm** (**82.68 in**)

Side Dump bucket

SIDE DUMP BUCKET, HP QUICK COUPLER

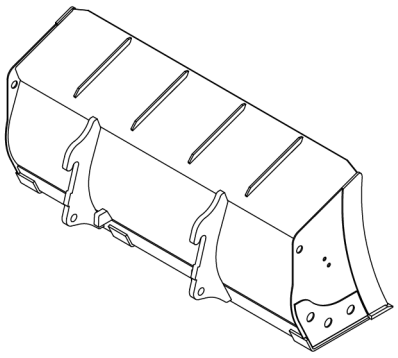


LEIL15CWL0117AA 10

Property	Z-bar				XT	
	21F	121F	221F	321F	21F XT	121F XT
Capacity heaped		**0.8 m³** (**1.05 yd³**)	**0.8 m³** (**1.05 yd³**)	**0.9 m³** (**1.18 yd³**)		**0.8 m³** (**1.05 yd³**)
Weight		**625 kg** (**1378 lb**)	**625 kg** (**1378 lb**)	**649 kg** (**1431 lb**)		**625 kg** (**1378 lb**)
Width		**1900 mm** (**74.80 in**)	**1900 mm** (**74.80 in**)	**2050 mm** (**80.71 in**)		**1900 mm** (**74.80 in**)

High Tip buckets

HIGH TIP BUCKET, HP QUICK COUPLER

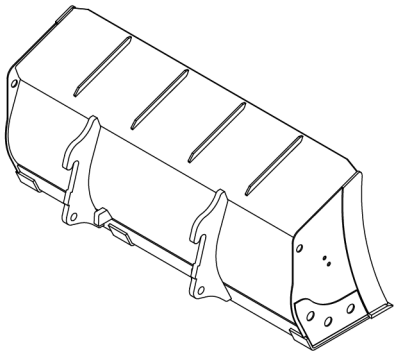


LEIL15CWL0105AA 11

Property	Z-bar				XT	
	21F	121F	221F	321F	21F XT	121F XT
Capacity heaped		**0.8 m³ (1.05 yd³)**	**0.8 m³ (1.05 yd³)**	**1.0 m³ (1.31 yd³)**		**0.8 m³ (1.05 yd³)**
Weight		**410 kg (904 lb)**	**410 kg (904 lb)**	**440 kg (970 lb)**		**411 kg (906 lb)**
Width		**1900 mm (74.80 in)**	**1900 mm (74.80 in)**	**2050 mm (80.71 in)**		**1900 mm (74.80 in)**

Heavy Duty (HD) buckets

HEAVY DUTY BUCKET, HP QUICK COUPLER

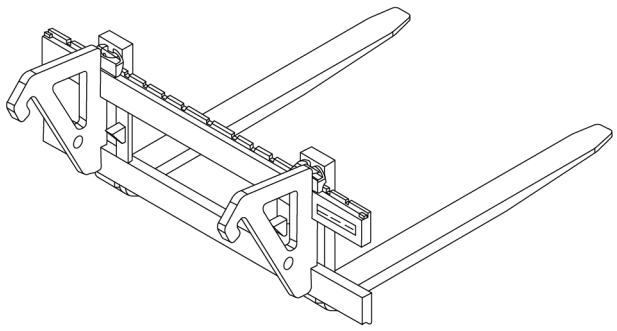


LEIL15CWL0105AA 12

Property	Z-bar				XT	
	21F	121F	221F	321F	21F XT	121F XT
Capacity heaped			**0.8 m³ (1.04 yd³)**	**0.9 m³ (1.17 yd³)**		
Weight			**355 kg (782.6 lb)**	**374 kg (824.5 lb)**		
Width			**1900 mm (74.8 in)**	**2050 mm (80.7 in)**		

Forks

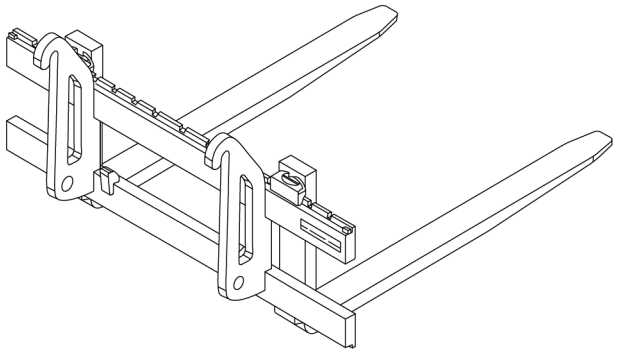
FORKS, HP QUICK COUPLER



LEIL15CWL0106AA 13

Property	Z-bar				XT	
	21F	121F	221F	321F	21F XT	121F XT
Tine size	**45 mm (1.77 in)**	**45 mm (1.77 in)**	**45 mm (1.77 in)**	**45 mm (1.77 in)**		
Weight	**236 kg (520 lb)**	**236 kg (520 lb)**	**232 kg (511 lb)**	**232 kg (511 lb)**		
Length	**1200 mm (47.24 in)**	**1200 mm (47.24 in)**	**1200 mm (47.24 in)**	**1200 mm (47.24 in)**		

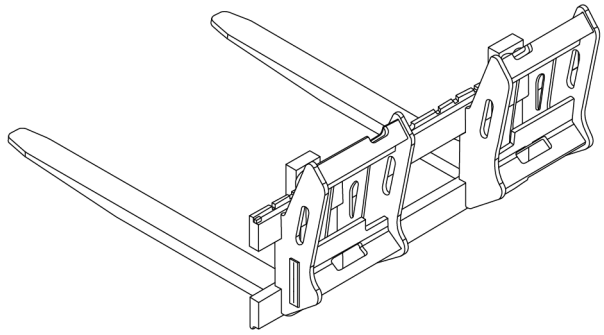
FORKS, HP QUICK COUPLER (XT)



LEIL15CWL0107AA 14

Property	Z-bar				XT	
	21F	121F	221F	321F	21F XT	121F XT
Tine size					**45 mm (1.77 in)**	**45 mm (1.77 in)**
Weight					**225 kg (496 lb)**	**225 kg (496 lb)**
Length					**1200 mm (47.24 in)**	**1200 mm (47.24 in)**

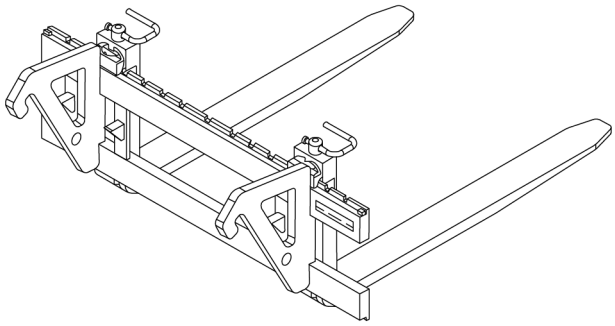
FORKS, SSL QUICK COUPLER



LEIL15CWL0108AA 15

Property	Z-bar				XT	
	21F	121F	221F	321F	21F XT	121F XT
Tine size	**45 mm (1.77 in)**	**45 mm (1.77 in)**	**45 mm (1.77 in)**	**45 mm (1.77 in)**	**45 mm (1.77 in)**	**45 mm (1.77 in)**
Weight	**261 kg (575 lb)**	**261 kg (575 lb)**	**261 kg (575 lb)**	**261 kg (575 lb)**	**261 kg (575 lb)**	**261 kg (575 lb)**
Length	**1200 mm (47.24 in)**	**1200 mm (47.24 in)**	**1200 mm (47.24 in)**	**1200 mm (47.24 in)**	**1200 mm (47.24 in)**	**1200 mm (47.24 in)**

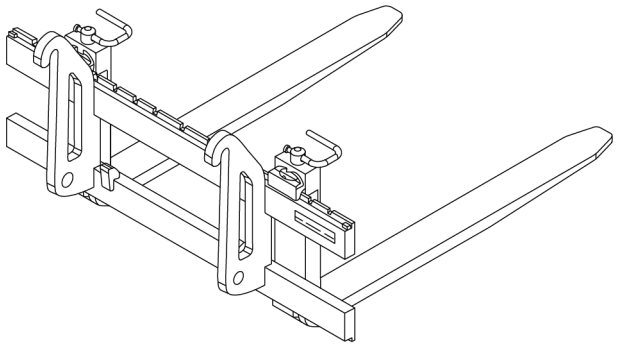
TILTABLE FORKS, HP QUICK COUPLER



LEIL15CWL0109AA 16

Property	Z-bar				XT	
	21F	121F	221F	321	21F XT	121F XT
Tine size	**45 mm (1.77 in)**	**45 mm (1.77 in)**	**45 mm (1.77 in)**	**45 mm (1.77 in)**		
Weight	**265 kg (584 lb)**	**265 kg (584 lb)**	**261 kg (575 lb)**	**261 kg (575 lb)**		
Length	**1200 mm (47.24 in)**	**1200 mm (47.24 in)**	**1200 mm (47.24 in)**	**1200 mm (47.24 in)**		

TILTABLE FORKS, HP QUICK COUPLER (XT)



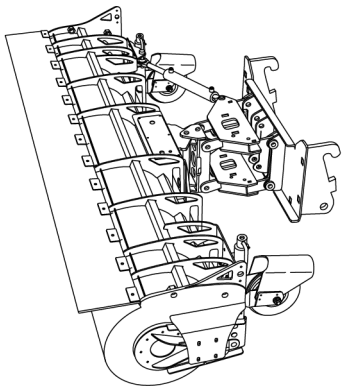
LEIL15CWL0110AA 17

Property	Z-bar				XT	
	21F	121F	221F	321F	21F XT	121F XT
Tine size					**45 mm (1.77 in)**	**45 mm (1.77 in)**
Weight					**254 kg (560 lb)**	**254 kg (560 lb)**
Length					**1200 mm (47.24 in)**	**1200 mm (47.24 in)**

Special attachments

NOTE: *refer to the dedicated manuals for more information about technical data and on-road regulations.*

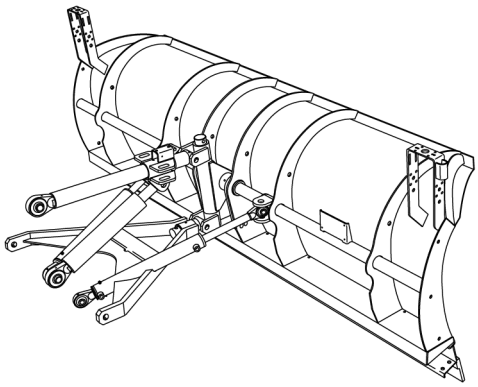
ANGLE BROOM



LEIL15CWL0120AA 18

Property	Z-bar				XT	
	21F	121F	221F	321F	21F XT	121F XT
Weight	**410 kg (904 lb)**	**410 kg (904 lb)**	**410 kg (904 lb)**	**410 kg (904 lb)**		
Width	**2549 mm (100.35 in)**	**2549 mm (100.35 in)**	**2549 mm (100.35 in)**	**2549 mm (100.35 in)**		

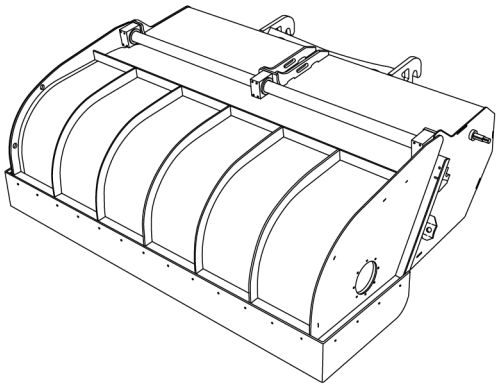
SNOW PLOW



LEIL15CWL0121AA 19

Property	Z-bar				XT	
	21F	121F	221F	321F	21F XT	121F XT
Weight		**292 kg (644 lb)**	**292 kg (644 lb)**	**292 kg (644 lb)**		
Width		**2545 mm (100.2 in)**	**2545 mm (100.2 in)**	**2545 mm (100.2 in)**		

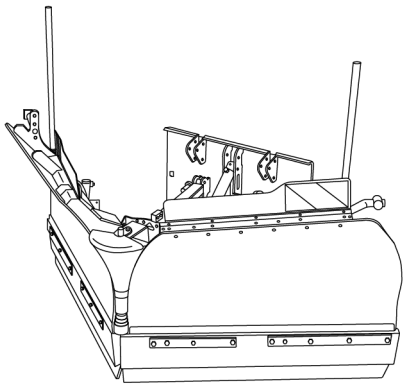
PICK UP BROOM



LEIL15CWL0122AA 20

Property	Z-bar				XT	
	21F	121F	221F	321F	21F XT	121F XT
Weight	**420 kg (926 lb)**	**420 kg (926 lb)**	**420 kg (926 lb)**	**420 kg (926 lb)**		
Width	**2214 mm (87.17 in)**	**2214 mm (87.17 in)**	**2214 mm (87.17 in)**	**2214 mm (87.17 in)**		

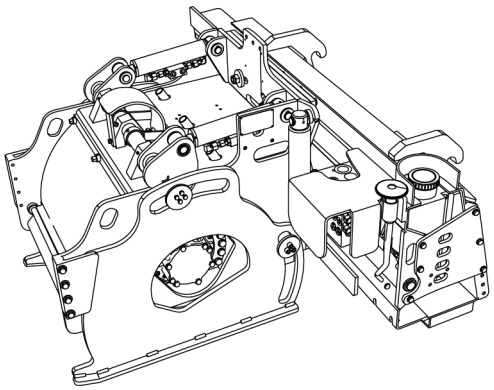
V-TYPE SNOW PLOW



LEIL15CWL0123AA 21

Property	Z-bar				XT	
	21F	121F	221F	321F	21F XT	121F XT
Weight			**480 kg (1058 lb)**	**480 kg (1058 lb)**		
Width			**2353 mm (92.64 in)**	**2353 mm (92.64 in)**		

COLD PLANER



LEIL15CWL0124AA 22

Property	Z-bar				XT	
	21F	121F	221F	321F	21F XT	121F XT
Weight			**900 kg (1984 lb)**	**900 kg (1984 lb)**		
Width			**600 mm (23.62 in)**	**600 mm (23.62 in)**		

NOTICE: *all the attachments not listed in this Operator's Manual are not approved for on-road circulation.*

Telematics

This machine may be equipped with a “telematics system”.

This is an asset-monitoring system that combines Internet, cellular, and GPS technologies. A transponder unit is mounted on the equipment that wirelessly communicates with a web-based user interface.

Using cellular technology, the transponder can send equipment data, including location, on/off status, usage and production metrics, diagnostic data, movement alarms, and unauthorized usage to the interface.

The system will help cut costs and keep accurate records.

See the furnished guide for operating your telematics system.

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Dealer's stamp

CNH Industrial Italia S.p.A. reserves the right to make improvements in design and changes in specifications at any time without notice and without incurring any obligation to install them on units previously sold. Specifications, descriptions, and illustrative material herein are as accurate as known at time of publication, but are subject to change without notice.

Availability of some models and equipment builds varies according to the country in which the equipment is being used. For exact information about any particular product, please consult your Case dealer.

CASE CONSTRUCTION